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COMPUTERWORLD

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Automated problem detection is promised with new IBM software service product. Page 104.

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Compaq, despite ravenous competition and a desolate domestic market, has hardly missed a beat as it approaches the close of its first decade. Page 81.

NEWSPAPER

Feds, users diverge on state of OSI

BY ELISABETH HORWITT
CW STAFF

WASHINGTON, D.C. — Phase 1 of the Government Open Systems Interconnect Profile went into effect on schedule this month, signifying a U.S. government vote of confidence that there are indeed sufficient commercial OSI products available to serve users' needs. However, some users, both inside and outside the government sector, apparently do not entirely share the government's view.

"We are telling federal agencies that while GOSIP will not satisfy all their data processing and communications needs right away, they must procure services and products from vendors that conform to OSI standards rather than implementations that provide the same services but lock you into that vendor," said Jerry Mulvenna, a manager at the National Institute of Standards and Technology who helped develop GOSIP. "We definitely believe that there are enough products for GOSIP 1"

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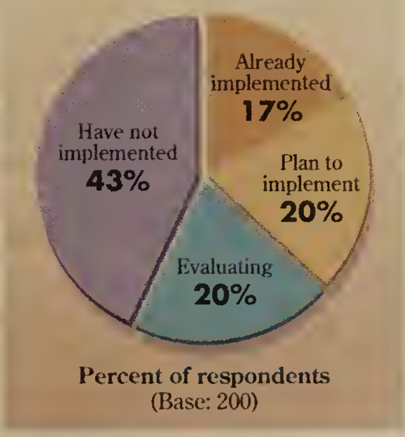
Opening up

Open Systems Interconnect is on the minds of many, with more than one-third of surveyed IS organizations already implementing or planning to implement the protocols



Source: Business Research Group
CW Chart: Paul Mock

IBM to unify systems tools

BY ELISABETH HORWITT
CW STAFF

WHITE PLAINS, N.Y. — As part of the product wave it is expected to unleash early next month, IBM will blacken in some of the lines of the systems administration framework that it has been talking up to key user and vendor groups for more than a year now.

The scheme promises to allow users to correlate and coordinate such administrative functions as security, updates and reconfiguration, troubleshooting, asset management and capacity planning across all aspects of an enterprise-wide computer installation, including networks, databases, applications, hosts and storage systems, according to sources.

Called Systemsview, the initial offering will define a consistent data model and user workstation interface structure for administering the full range of information systems "disciplines," said Don Haile, IBM's enterprise systems director of software systems.

The six disciplines defined by IBM as "areas that customers need to focus on as they manage their systems" are problem, change, configuration, performance, operations and business management, Haile said.

The framework will reportedly extend across existing IBM systems administration tools as well as IBM's network management platform, Netview. Among the more solid of IBM's Systemsview announcements next month, according to sources, will be the following:

- Products that assist in software distribution, including a delivery manager that will enable the host system to remotely control personal computers and automatically download software.
- A data structure, based on SQL, that will be used to collect

Continued on page 104

Update will extend DB2's distributed capabilities

BY JOHANNA AMBROSIO
CW STAFF

ARMONK, N.Y. — IBM's Summit mainframe announcement next week will also feature a new version of DB2 that incorporates features for distributed database management among different machine classes, sources said.

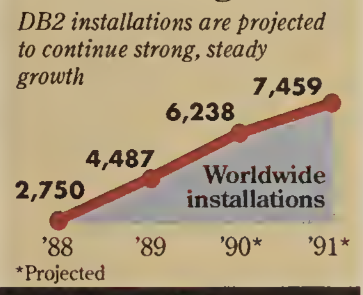
Users of DB2 Version 2.3 will be able to read and update an IBM SQL/DS database from within a DB2 application, the sources said. In comparison, the current release of DB2 has the ability to read and update only another DB2 database.

IBM has said it will roll out the ability for DB2 to communicate with all of its other strategic database managers over time. In the meantime, said Shaku Atre, partner at the consulting firm Atre/Computer Assistance in Rye, N.Y., IBM will announce

Continued on page 104

Still climbing

DB2 installations are projected to continue strong, steady growth



Source: International Data Corp.

Opening up

IBM to license OS/400 internal interface code. Page 8.

'Lite' version of OS/2 due next month

IBM's intentions get software developers busy but leave users skeptical

BY PATRICIA KEEFE
CW STAFF

A determined IBM is gearing up to introduce a 2M-byte version of OS/2 Standard Edition, priced under $200, late next month, according to several sources close to the company.

Some key developers, including Lotus Development Corp., Micrografx, Inc. and Borland International, have already confirmed their support for what has alternately been dubbed OS/2 Lite or OS/2 1.3. At the same time, a less-than-enthusiastic Microsoft Corp. is calling for caution.

IBM may have its work cut out for it, as several users contacted last week were highly skeptical about the usefulness of or need for a less memory-intensive OS/2.

Price Waterhouse plans to move its Lotus Notes servers to OS/2 Lite, mostly for performance and memory reasons. However, Price Waterhouse information systems director Sheldon Laube said he "is not swayed in the slightest" when it comes to the desktop.

"As far as OS/2 1.21 vs. OS/2 Lite is concerned, corporate buyers have already determined that [Microsoft] Windows 3.0 meets more of their needs because it can take advantage of the [Intel Corp. 80386] and 16-bit OS/2 cannot," said Brian Livingston, a network consultant and member of the board of the New York-based Microcomputer Managers' Association.

Arthur Block, a vice-president at Manufacturers Hanover Corp. in New York, dismissed OS/2 Lite as a "silly diversification of resources" that could be better spent on developing OS/2 Version 2.0.

If a resistant Microsoft does not offer OS/2 Lite, analysts and developers are predicting the first public break over OS/2 between the two industry giants.

"It doesn't matter whether Microsoft offers it; IBM is a credible enough company so that its stamp of approval on a

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Quotable

"I understand the potential impact of New Wave, but I don't understand what it is."

NEIL KING
SCOTT PAPER

On Hewlett-Packard's New Wave Computing strategy. See story page 105.

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From *Made in America* by the MIT Commission on Industrial Productivity: "Though the U.S. computer industry remains strong, the outlook will not be as bright without strong initiatives . . . Innovative U.S. start-up firms frequently sell their technology to Asian competitors and provide market knowledge and even direct assistance . . . American universities conduct nonsecret R&D and are educating a growing cadre of Asian engineers . . . We do not advocate that universities and laboratories shut the door on basic research, but greater protection of American advances as they get closer to products may be in order."

New vistas on the future of technology and the history of the world are possible for museum visitors through the use of computers. Page 18.

Leave the driving to job schedulers, console automation software and problem management tools. Page 59.

EXECUTIVE BRIEFING

■ **The immediate focus may be on new mainframes, but a complex systems administration strategy** could have long-range effects for the IS community when IBM makes its multifaceted product announcement next week. A product known as Systemsview is the first step in IBM's plan to provide IS managers with a common framework for administrative functions such as coordination of security, software updates, configuration changes, troubleshooting, asset management and capacity planning for multiple computing platforms. Another announcement expected in the Sept. 5 avalanche is a new version of the DB2 database management system, reportedly the first product to implement IBM's Distributed Relational Data Architecture. **Page 1.**

■ **There's a lot of merger activity associated with data center automation** these days. Consolidations are pushing many organizations further into automation as they attempt to push the bulk of the work load through fewer, larger data centers. Also, there's a rising interest in interfaces between automation tools, as data center managers begin to seek efficiencies beyond those obtainable with scattered pockets of automation. **Page 59.**

■ **Now that you know IBM's plans to announce its Summit** strategy next month but still don't have details such as price and performance, what do you do? According to some IS managers in major companies, the best thing to do is wait and see. **Page 25.**

■ **Managers shouldering IS arms** upon leaving the military can find themselves highly marketable in the civilian world. Senior officers in particular have a lot to gain because of the scope of the projects and systems they've managed. **Page 88.**

■ **In this age of specialization,** the specialists are becoming even more specialized. One of the latest moves in certification is the testing of information knowledge engineers, sponsored by the International Association of Knowledge Engineers. **Page 49.**

■ **The reaction from large IS shops to IBM's AS/400 announcements last week** could be summed up with a pretty unenthusiastic "that's nice." What did perk up a few ears was IBM's decision to give users and third-party developers more access to the internal OS/400 codes that have previously been kept secret. **Page 8.**

■ **The subtle hum of a VDT can be more of a problem** than most men realize. According to two researchers at the University of Evansville, Ind., the 16-KHz tone is especially irritating to women, and women who are exposed to the tone are more prone to headaches, stress-related complaints and work errors. **Page 10.**

■ **On-site this week.** Back to school means using image processing to manage 70,000 student loan applications at PNC Financial Corp. **Page 27.** Time savings is one of the key benefits seen in Cumberland Farms' plan to install a PC-based store management system in its 1,150 convenience stores. **Page 33.** Providing a network to satisfy the needs of more than 5,000 users — including those who want to be on the leading edge and those who couldn't care less — was one of the challenges facing U.S. Senate IS personnel when they began tying together a nationwide, multiplatform maze of systems. **Page 43.** It took a top-down directive, but administrative staff members at the University of California at San Diego are finally getting the same type of network access that has long been enjoyed by their counterparts on the research side of the campus. **Page 44.**

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Apple lawsuit moves at snail's pace

BY JAMES DALY
CW STAFF

SAN FRANCISCO — Despite hopes that the lengthy copyright suit between Apple Computer, Inc. and defendants Microsoft Corp. and Hewlett-Packard Co. could be resolved at a hearing late last week, the glacial pace of the procedures continued. A judge new to the case declared a further continuance to consider motions and become more familiar with the particulars of the suit.

After nearly three hours of testimony from lawyers, U.S. District Judge Vaughn R. Walker scooped up his papers and announced that he "was not prepared to announce a decision" but would review the submitted motions before arranging another hearing. No date was set for the next meeting.

Judge Walker, however, touched upon a potential Achilles' heel in Apple's claims last week when he noted that the crux of the case may eventually hinge on the wording of the original contract. The Apple contract apparently "failed to limit the use of the licensed features," he said.

Jack Brown, a Phoenix-based lawyer heading up Apple's legal team, conceded that the contract "certainly wasn't done with the greatest artistry" but added that it had "never been Apple's intention to give away the whole interface."

Lawyers from Microsoft and HP also argued that the recent copyright decision involving Lotus Development Corp. and Paperback Software International, Inc. should have no bearing on their case because of the original license Apple inked with Microsoft. Lotus recently scored an important victory when a federal judge ruled that Paperback Software's clone of Lotus' popular 1-2-3 spreadsheet copied the "look and feel" of the original Lotus application [CW, July 2].

Both sides argued strenuously to narrow the focus of the protracted suit, which has gone through three judges and has lasted 2½ years. In late March, Judge William W. Schwarzer handed the case over to Walker after Schwarzer accepted a position as head of the Federal Judicial Center in Washington, D.C.

Attorneys said that the case should proceed more quickly when Walker is up to speed on the specifics.

"It should go much faster now," said Neil Borstyn, an attorney for HP. "We've clarified the issues that need to be decided." Those issues, Borstyn said, include the scope of Apple's original license and the copyright protection it offered.

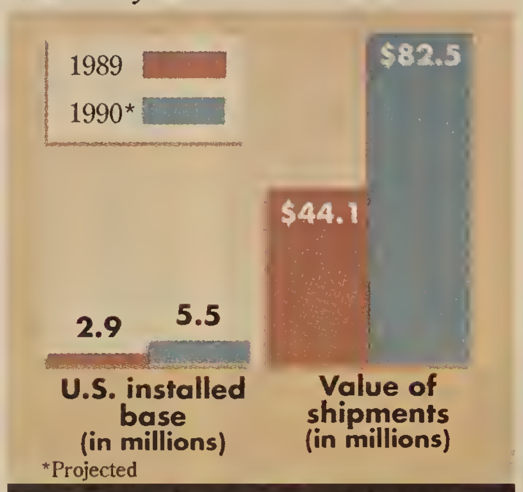
Over the line

Although Microsoft was licensed to duplicate the look and feel of Apple's Macintosh screen appearance when it created Windows Version 1.0, Apple contends that Version 2.03 and HP's New Wave, which is based on the updated Microsoft program, overstepped the boundaries of the 1985 agreement when they copied the "audiovisual expression" of the Macintosh too closely.

The case has essentially been at a standstill since July 1989, when Schwarzer dramatically scaled down the scope of the case, ruling that all but 10 of the 189 features that Apple claimed both programs unlawfully duplicated would be subject to further consideration [CW, July 31, 1989].

Sparkling Windows

Windows installations are expected to almost double this year



Source: International Data Corp. CW Chart: Paul Mock

DG resigns itself to more staff cutbacks

BY NELL MARGOLIS
CW STAFF

WESTBORO, Mass. — Still in search of the profits that continue to elude its grasp, Data General Corp. announced last week that it will eliminate some 2,000 employees from its worldwide work force over the next several weeks.

The move marks the sixth consecutive large-scale fourth-quarter layoff for DG, which is now down 45% from its peak employment, said William J. Milton Jr., an analyst at Brown Brothers, Harriman & Co. "Obviously," Milton added, "the company can't go on like this or there won't be anyone left."

"We now have the organization in place and the appropriate mix of employee resources to compete successfully in today's information technology marketplace," said DG's Chief Executive Officer Ronald Skates in a prepared statement.

"They do have a strong balance sheet," Milton noted. In addition, he said, "through all of these losses and layoffs, remarkably, revenue has remained basically flat." Since it has stayed flat in the $1.2 billion to $1.3 billion range, he added, the firm's immediate survival is not at stake.

The same cannot be said of its growth prospects. That sales have not nosedived, Milton said, is a testimony to DG's particularly loyal user base.

Unfortunately, as several analysts have noted in recent months, the loyal customers in question are chiefly patrons of DG's proprietary minicomputer offerings. The reduced instruction set computing-based Aviion workstation line, on which the firm is betting its future, has been well-received by both market analysts and early users but is not yet contributing a major share to the bottom line.

"Aviion is their one hope, and it isn't a strong one. The workstation market is already a very crowded one, and DG has neither critical mass nor credibility," Milton said.

The proliferation of similar observations, coupled with stock now trading at about 50% of its book value, has fueled speculation that a takeover of DG is in the offing. A DG spokesman, however, denied that any such deal is being entertained and said DG is not for sale.

News of the latest DG workforce reduction raised few eyebrows on Wall Street, not so much because word of it had leaked out earlier in the week but because a major trim of the employee roster has become something of a predictable summertime event for the company.

CA, Goal settle out of court

BY JOHANNA AMBROSIO
CW STAFF

COLUMBUS, Ohio — Computer Associates International, Inc. and Goal Systems International, Inc. last week announced they had settled the lawsuit filed by CA against Goal.

The terms of the out-of-court settlement were not made public, but in Goal's second-quarter financial statement, also released last week, the company said that it will issue a series of fixed payments to CA. The second-quarter payment amounted to $530,000.

Goal said that it has six months to remove all infringing code from its products. During that time, Goal said, it will be allowed to continue to service and support its customer base. At the end of six months, CA will verify the deletion of infringing code.

Suit with infringe

The lawsuit, which was filed June 25, alleged that Goal's Runtrac and Jobtrac products infringe on CA copyrights [CW, July 2]. The company purchased these products from an independent developer, J. William Bennett, whom Goal has since released [CW, July 16].

The settlement applies only to the lawsuit filed against Goal, the company said, and has no bearing on any legal proceedings against Bennett and his company. Bennett could not be reached for comment.

CA Chairman Charles B. Wang said in a prepared statement, "Goal responded professionally to the entire situation. They recognized they had a problem, even though, by and large, it was not of their own making."

David C. Wetmore, Goal's president and chief executive officer, announced, "I, too, am happy we were able to settle this matter quickly with CA. CA was especially sensitive to the needs of our customers, and the terms of the settlement reflect their appreciation of these concerns."

CORRECTIONS

American Management Systems in Arlington, Va., is an independent entity and was not acquired by Philadelphia-based Bell Atlantic Corp. [CW, Aug. 6]. Bell Atlantic Systems Integration Co. is a joint venture of the two companies. Also, a sentence attributed to Al Smith, executive vice-president of the Bell Atlantic unit, regarding his company's marketplace, incorrectly referred to Ameritech and should have read: "The move was necessary because Bell Atlantic was trying to capture the broader needs of its customers."

Unisys Corp.'s Ally software for Sun Microsystems, Inc. workstations [CW, July 30] will be priced at $1,000 for each workstation supported.

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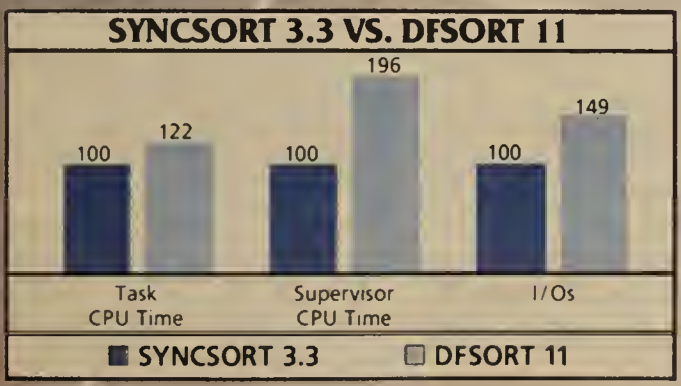

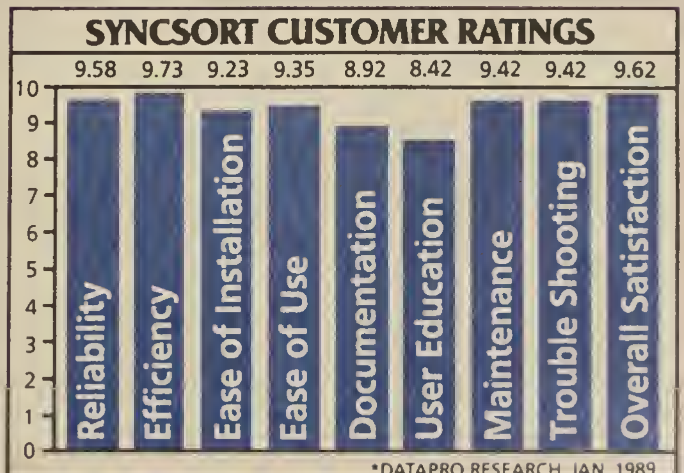

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NEWS SHORTS

NSA denies killing security center

The National Security Agency (NSA) last week denied a published account that said the agency is dismantling its National Computer Security Center, a semipublic unit of the supersecret agency that was established by the U.S. Department of Defense in 1982 to evaluate and certify the security, or levels of trust, of computer systems. A spokeswoman for NSA said the center is being restructured to align its activities more closely with NSA's communications security work. The move was prompted by the blurring of distinction between telecommunications and computer systems, she said. Patrick Gallagher will remain director of the center, and the center will continue to meet its commitments to industry for product evaluation and certification, the spokeswoman said.

. . . .

Systems Center moves on AS/400

Systems Center, Inc. in Reston, Va., announced last week the acquisition of automated management software for IBM's Application System/400 midrange line. In a transaction the companies said was worth $2.4 million, Systems Center purchased the AS/400 software and related assets from Informed Management Environment, Inc. in Houston. Systems Center, formerly VM Software, Inc., is a relational database vendor that offers more than 50 products, mostly geared to the IBM mainframe environment.

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Intel repurchases shares

Intel Corp.'s board of directors last week announced for the second time its authorization to repurchase 20 million shares of its stock in open market or negotiated transactions. Chairman Gordon Moore said the company's financial position and investment alternatives, as well as the market's retreat, recently contributed to the board's decision. He added that going through with this buy-back program would not interfere with Intel's ability to continue its capital and research and development programs. For the quarter ended June 30, Intel had 204 million shares of common stock and equivalents outstanding, the company said. Intel's previous and only other buy-back was in 1987, when it repurchased 13.35 million of its shares from IBM at $27 per share, the company said.

. . . .

Lotus has a new Agenda

Lotus Development Corp. last week announced that it has begun to ship Agenda 2.0, described as a significantly enhanced version of its personal information manager. Priced at $395, Agenda 2.0 features improved ease of use coupled with four business starter applications: Activities Planner, Account Manager, People Manager and Information Sifter. Lotus is guaranteeing that if users do not become productive within 30 minutes, they can return the package to Lotus within 30 days for a full refund.

. . . .

Magellan tool kit ships

Lotus also unveiled the Magellan Viewer tool kit for Magellan 2.0, a utility and DOS shell for personal computers. The tool kit will enable developers to create new "viewers," which display the contents of common file formats. It includes sample code for two viewers, as well as assistance in how to design, test and debug a viewer. New viewers will be included in the Lotus Products Enhancement Guide. Developers will also receive discounts on software, the annual developers conference and a quarterly newsletter subscription. The tool kit costs $150 and has a limited 90-day warranty, telephone support and a customer assurance plan.

. . . .

Never mind!

Citizens & Southern Corp., an Atlanta-based regional bank, apologized last week to 10,000 customers in Georgia, Florida and South Carolina who were mistakenly sent notices that they were in default on their home mortgages. Because of a combination of human and computer processing errors, the default notices were sent instead of the proper late-payment notices, according to bank spokesman Scott Scredon.

Wang wins $841M contract

BY SALLY CUSACK
CW STAFF

LOWELL, Mass. — The U.S. Department of State has awarded Wang Laboratories, Inc. a contract that is potentially worth up to $841.3 million to supply computer systems and services to government agencies on a worldwide basis.

Under terms of the indefinite delivery/indefinite quantity contract, Wang will supply, install and support midrange systems, personal computers, workstations, software, communications and related peripherals, as well as technical support and training.

The contract covers the next five years, with various extension options for a total of 11 years. Both commercial and secure products are included in the contract, the vendor said.

"Hopefully, this means there will now be resources and revenue coming in so Wang can increase its [research and development] to support the existing product line," said Douglas S. Eschner, data processing manager at CBC Environmental Corp. in Oak Creek, Wis. The laboratory, which uses a Wang VS 100 and some VS 80s, was evaluating other technologies approximately one year ago, Eschner said, but held off alternative purchases because Wang has offered improved products and price reductions during the past year. He added that no final evaluation has been reached, however.

Whither the bottom line?

While the contract gives the Wang name some much-needed visibility, the question remaining is just how much of a contribution this will actually make to the company's bottom line, said Chris Christiansen, director at Meta Group, Inc., a Redding, Conn.-based research and consulting firm.

"With an indefinite contract, there are no specific quantities or dates," Christiansen noted. "It's a nice steppingstone in terms of returning Wang to a stable position in the eyes of its customer base, but the company still has a long way to go."

Among the applications software included in the contract are word processing, image processing, electronic mail and messaging, database management and graphics capabilities.

The computer systems to be supplied will support the office automation and distributed information processing needs of the Department of State, the U.S. Agency for International Development, the U.S. Information Agency, the Foreign Agricultural Service of the U.S. Dept. of Agriculture and the Foreign Commercial Service of the U.S. Dept. of Commerce.

OS/2

FROM PAGE 1

product is all we need to know," Borland President Philippe Kahn said. "Corporate users should seriously consider it."

However, Micrografx President George Greyson said the bottom line for users is still going to be applications. "OS/2 is still limited by the number of applications," agreed Norman Thurow, director of IS development for the data systems division of General Dynamics Corp.

Many users said they suspect IBM has produced the 2M-byte version of OS/2 because it told buyers of its Personal System/2 Model 50, 55SX and 60 systems that OS/2 would run on an Intel 80286-based box. In fact, IBM is targeting the massive installed base of 286-based computers, said one source, quoting officials at IBM's Austin facility.

"IBM's intent here is to make OS/2 more accessible to the majority of the installed base," said John Dunkle, an analyst at Workgroup Technologies in Hampton, N.H.

Others perceive a more sinister motivation. "IBM is just doing this to try and knock some of the wind out of Windows 3.0's sales," said Steve Hess, an analyst at Creative Strategies Research International.

"OS/2 has become a pawn in the increasingly tense IBM/Microsoft relationship. IBM is betting heavily on OS/2, but Microsoft is intent on wringing every last cent out of the corporate Windows market," said Bill Bluestein, an analyst at Forrester Research, Inc. Right now, Windows 3.0 provides better desktop functionality and ease of use, at least until OS/2 2.0 comes out, users agreed.

However, Livingston said, "I think it would be futile to expect to run OS/2 or Windows 3.0 on a 286 machine, especially when 386-based machines cost just a bit more."

Developers who would be the source of missing OS/2 applications were decidedly more upbeat.

"We like it because the performance is better, it has more drivers, and IBM has reduced memory requirements by between 1M and 2M bytes," a Lotus spokeswoman said.

> "IBM IS JUST doing this to try and knock some of the wind out of Windows 3.0's sales."
>
> STEVE HESS
> CREATIVE STRATEGIES

Even Microsoft agreed that OS/2 Lite, which is based on the recently released OS/2 1.21, provides better performance, file management and printing features, consumes less memory and offers improved application loading.

Steve Ballmer, Microsoft senior vice-president of system software, conceded that OS/2 Lite is "definitely better than 1.21 in certain ways."

Microsoft, nevertheless, has indicated it will not offer OS/2 Lite unless requested to do so by OEM customers, who just started shipping OS/2 1.21. Ballmer reiterated last week that his customers are waiting for the 32-bit OS/2 2.0.

Ballmer outlined two issues Microsoft has with OS/2 Lite: the timing of its release and the level of functionality under 2M bytes of memory. "We're gonna make [OS/2 Lite] available, but we just did a release. How often can I turn OEMs on releases and expect them to be interested?"

Noting that OEMs waited seven months for OS/2 1.21, Ballmer suggested that "the last thing they'll want to do is wait for another promise for another new release further out into the future."

Running OS/2 in 2M bytes, Ballmer suggested, may only be possible by not installing a series of features including the DOS box, the printer spooler and the network and high-performance file system. "It could be that you can't install as many features as [under OS/2 1.21]."

Privately, many developers view the OS/2 schism as an indication that the long-standing IBM/Microsoft marriage is landing in divorce court, something both companies denied.

"We are trying to work some [disagreements] out. While anything is possible, it is not our objective to go our separate ways with OS/2," Ballmer said.

An IBM spokeswoman denied that any friction exists, adding that IBM is only following through on a Comdex/Fall '89 commitment to try to reduce OS/2's memory requirements below 3M bytes.

Desktop Unix leaders seek PC compatibility

AT&T, Intel and The Santa Cruz Operation join forces in attempt to forge specification

BY JEAN S. BOZMAN
CW STAFF

SANTA CRUZ, Calif. — AT&T, Intel Corp. and The Santa Cruz Operation (SCO) — the dominant players in the desktop Unix market — stood shoulder-to-shoulder in the California sunshine last week as they took a shot at forging a standard for Unix on Intel 80386-based machines. It is a shot they hope will echo 'round the world, since most parties to the Unix-standards battles of the 1980s have already agreed to go along, industry analysts said.

The move to define a single binary compatibility specification for AT&T Unix System V on Intel 386-based machines, announced at last week's SCO developers conference, is intended to promote shrink-wrapped Unix applications for a wide variety of Intel 386- and I486-based machines. However, analysts stressed that computers running other variants of Unix would still be able to interoperate with the Unix System V/386 machines and that many Unix applications would remain portable across multiple hardware platforms with few, if any, programming changes.

> "WE'LL STILL FIGHT and scream about whose SCSI driver is the best, but we're agreeing on the way the interfaces touch the applications."
>
> DOUG MICHELS
> THE SANTA CRUZ OPERATION

Still, the SCO approach has its advantages. "You'd rather not have 20 versions of Wordperfect for Unix desktop machines," explained Judith Hurwitz, vice-president of Patricia Seybold's Office Computing Group in Boston. "Why have one version for HP's 386 machines and another one for IBM's machines? If you only need one packaging and one product on the shelf that works on the Intel 386 chip, that's economy of scale."

SCO is a privately held business that sells the Unix System V/386 and Xenix operating systems, along with the Open Desktop interface, to value-added resellers. Industry analysts said they believe SCO's 300,000-plus licenses account for 80% of the desktop Unix market — supporting perhaps as many as 1½ million end users. The firm, of which Microsoft Corp. owns a 20% share, estimated its 1990 revenue at $100 million.

The AT&T/Intel/SCO pact was endorsed by the Unix International standards group, which supports AT&T's Unix System V operating system, and by its counterpart, the Open Software Foundation (OSF), which is developing a separate Unix standard, OSF/1. 88open Consortium, a standards group made up of vendors using Motorola, Inc.'s reduced instruction set computing processor, also pledged support, saying it would allow applications to be ported from Unix System V/386 systems to 88000-based systems with a simple recompile.

AT&T, Intel and SCO made their first pledge to unify AT&T Unix System V applications in 1988. However, initial efforts failed as computer manufacturers made custom extensions to the basic Unix System V/386 operating system. "We didn't have a process in place to ensure that things didn't go astray," explained Larry Dooling, president of AT&T's Unix Software Laboratory. "The engineers [at different firms] weren't communicating."

Starting next month, AT&T, Intel and SCO will hold periodic meetings to define an industry standard for Unix System V/386 desktop applications. The meetings, which may be held monthly, will be open to any vendors that wish to attend, SCO Vice-President Doug Michels said. "We'll still fight and scream about whose SCSI driver is the best," Michels said, "but we're agreeing on the way the interfaces touch the applications. We're agreeing on the way to a paint a pixel on the screen."

Intel's competitors, Motorola and makers of Sun Microsystems, Inc.'s Scalable Processor Architecture chips, have yet to be brought into the discussion, however. Without the Intel competitors, a comprehensive Unix standard for desktop applications would not be truly complete, industry analysts said. Michels and others said there would be an attempt to involve the competing firms in the evolving software standard discussion.

One other voice was not heard from: Microsoft, which sells the competing OS/2 multitasking operating system. "We don't see any significant impact [on OS/2] from this announcement," Microsoft spokesman Marty Taucher said. "We think Unix and OS/2 are designed to do fundamentally different things." The message Microsoft wants to deliver is that SCO has been a leader in bringing shrink-wrapped Unix to the market."

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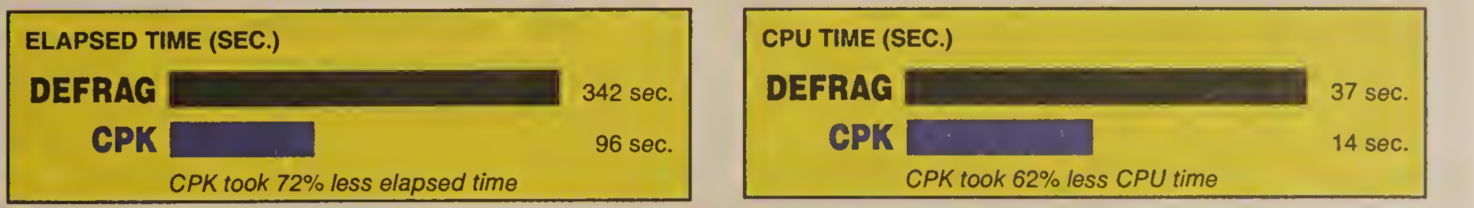

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IBM spreads AS/400 goodies

But low-end systems and OS/400 hardly have users in a frenzy

BY MARYFRAN JOHNSON
CW STAFF

NEW YORK — For big clients such as Campbell Soup Co. or Georgia-Pacific Corp., IBM's Application System/400 announcements last week were welcome but hardly earthshaking.

And no one at Tiffany & Co. or Mrs. Fields Cookies got in a lather about additional low-end systems or the new release of the OS/400 operating system.

"The AS/400 announcements were nice but anticipated," said Harry Wallaesa, corporate vice-president of MIS at Campbell Soup in Camden, N.J. "IBM's development path is pretty clear, and for large customers, they do a good job of positioning for that environment."

"The AS/400 really needs to become all things to all people," added Paul Quinn, president of Fields Software Group, the systems development subsidiary of Mrs. Fields Cookies. "I'm encouraged by the fact that IBM is opening the system up so users can control more of what's going on."

Quinn was referring to the "open access" feature in OS/400 Release 3.0, which allows customers and third-party vendors to gain access to internal interface codes that IBM formerly kept clamped shut.

The clarity of the AS/400's future and the "something-for-everyone" nature of the latest announcement seemed to spread comfort and a degree of relief.

"What we're seeing with the AS/400 line is more maturity in the enhancements. The box is out of the toddler stage," said Carolyn Griffin, an analyst at International Data Corp. in Framingham, Mass.

For small businesses and System/36 users, the best news was a trio of low-end systems — priced at $12,195, $18,250 and $23,850 — the cheapest one being a System/36 (called AS/Entry) that can be field-upgraded to an AS/400. The new release of OS/400 should also be inviting, with ease-of-use features that mask the complexities of the operating system.

Large customers were mollified with new disk mirroring capabilities, doubled memory capacity on the high-end models, new disk and tape media, plus a fire-sale feature: 15% discounts on older disk storage devices.

"Those deep discounts on the [direct-access storage devices] are real good news," said Scott Russell, a senior technical analyst at Georgia-Pacific in Atlanta. The dramatic reduction in floor space required by the new 9336 drive is "a big improvement" for large shops, he added.

Even industry analysts got some "futures" to pontificate on with IBM's promise of more powerful high-end systems in early 1991, including multiprocessing capabilities to take the AS/400 up to the bottom rungs of 3090 mainframe power.

"We haven't seen the wall yet in either direction — going lower or higher," said Robert LaBant, vice-president of Application Business Systems, the IBM division responsible for the AS/400.

At Tiffany's data center in Parsippany, N.J., the new operating system and high-end memory expansion capability mean that a planned upgrade of an AS/400 Model B60 can wait. "We're taking the new release of the operating system early, although we're not normally a pioneer," said Eric Corbman, director of technical support and planning. "We've been pleased with IBM's direction, though we sometimes get frustrated with whether they're moving fast enough on the high end."

Although famous for its jewelry stores, Tiffany has moved into multiple-channel retailing through direct mail, 800 numbers, corporate business, wholesaling and international distribution. All of the business — except for the personal computer local-area network-based international stores — runs on two AS/400s, the Model 60 and Model 70.

Several customers and analysts took note of the open-arms welcome IBM is extending to third-party software vendors.

"IBM has finally acknowledged the fact that other people out there can do some things better," said Gibbs Vandercook, senior manager of the advanced technology group at Ernst & Young in Chicago.

As part of the announcement, 10 software companies unveiled their IBM Systems Application Architecture-compliant cooperative processing applications for the AS/400. Included among the business partners were Andersen Consulting, Computer Associates International, Inc., Marcam Corp., J. D. Edwards & Co., Software 2000 and Information Builders, Inc.

Storage options

IBM's AS/400 revamp includes new tape and disk storage devices

Device	Media	Storage capacity	Price
9336 Model 10	5¼ in. disk	942M bytes	$26,000
9336 Model 20	5¼ in. disk	1.7G bytes	$39,000
9348 Model 2	½-in. streaming tape	1.6K-6.25K bit/in.	$22,600

Source: IBM

CW Chart: Doreen Dahle

Midrange treats

While much attention was focused last week on the low-end hardware filling out IBM's AS/400 line, there were other notable highlights in the announcement:

- The new 9336 disk unit reportedly increases the high-end storage capacity that an AS/400 can support from 38.4G bytes to 54.8G bytes. These new drives offer a 38% faster average seek time than the 9332 and 9335 disk drives, and the 9336 can pack up to 20G bytes of storage into a single 6-ft-high AS/400 rack.
- For high-end customers, a new 32M-byte memory card based on IBM's 4M-bit dynamic random-access memory chip can double main memory on the Model B70 to 192M bytes.
- Disk storage mirroring capabilities in OS/400 Release 3.0, the new release of the operating system, allow the system to keep an exact copy of information on a second disk. If a mirrored disk fails, the system keeps running.
- Operational Assistant, another new capability in OS/400, makes the AS/400 easier to use for new or nontechnical customers through streamlined menu screens and Help text. It is mainly intended to encourage migration from System/36s to the AS/400 platform.
- An "open access" feature in OS/400 allows selected third-party software vendors and systems programmers at customer sites to tinker with certain machine interface instructions. This enables customization of the AS/400 for particular applications and increases interoperability with other vendors' computers.
- New networking features — mostly geared toward client/server environments — include an integrated Ethernet LAN attachment, an AIX AS/400 connection program for RISC System/6000 workstations, a 16M/4M-bit Token-Ring LAN adapter and Transmission Control Protocol/Internet Protocol Telnet support.
- SQL enhancements, new languages such as Fortran/400, RM/Cobol-85 and Procedures Language 400/Rexx, plus Application Program Driver, which is a precoded menu utility.

OSI

FROM PAGE 1

to make such implementations feasible, he added.

The government's release of GOSIP is accelerating user implementations of the standard in both the public and private sectors, according to a recent report from Newton, Mass., consulting firm Business Research Group (see chart page 1).

However, some government users apparently feel they can comply with the spirit of GOSIP without actually rushing to convert all their current systems to OSI.

The National Aeronautics and Space Administration's Lewis Research Center in Cleveland, for example, does not have direct plans for OSI, even though "we know we have to get into it," according to network analyst Daniel Cica. "I think we can still buy [Transmission Control Protocol/Internet Protocol] as long as the vendor also provides OSI compliance" on the same product, he added. The center has begun talking to OSI software vendors and plans to migrate its Digital Equipment Corp. systems to OSI-compliant Decnet Phase V, Cica said.

In the private sector, the promise of multivendor electronic mail connections via CCITT's X.400 is a major driving force behind OSI, Business Research said. However, many private sector companies also have a reluctance to pay the up-front costs of full OSI conversion, according to open systems consultant Jere Thomas. "The next-quarter profit and what's going to be here tomorrow is driving the ship," he said.

Thomas, who helped found the Houston 30 consortium to provide user input on standards development, said that corporate management needs to look beyond short-term returns and say, "Yes, migration to OSI will cost us next year, but in five years we'll get the gravy."

> "THE NEXT-quarter profit and what's going to be here tomorrow is driving the ship."
>
> JERE THOMAS
> CONSULTANT

To hear users tell it, however, the main reason for their reluctance to convert to OSI is the lack of functionality in current products based on the standard. Nor does implementing X.400 necessarily mean a rapid move to the rest of the OSI stack.

Du Pont Co., for example, announced one year ago that it would use MCI Communications Corp.'s X.400 electronic mail services as a method of exchanging messages and business documents with its trading partners worldwide. Recently, the vendor implemented a Hewlett-Packard Co. gateway so that its own three internal E-mail systems — none of which are X.400-based — can talk over MCI's X.400 network.

Du Pont "would like to migrate to X.400 internally once it matures and once our vendors provide high-performance software" based on the standard, said Gordon Preston, the company's product manager for corporate E-mail management. Areas in which proprietary E-mail systems currently outperform X.400 include directory functions and special features such as automatically returning a message to sender when the recipient cannot be found, Preston added.

Du Pont is also "committed to implementing" the rest of the OSI standard "as soon as it's available," Preston said. "Our expectation is that it will be 1995 before the OSI protocols are completely available."

Hughes Aircraft Co. is another company whose commitment to full OSI migration has had to wait for the standard to mature, according to Jeff Littrell, manager of local-area network E-mail. "Right now, I think OSI products are in a good stage for allowing users to get their feet wet but not for replacing our existing infrastructure." Major gaps in current OSI products center around the X.500 directory and network management, he said.

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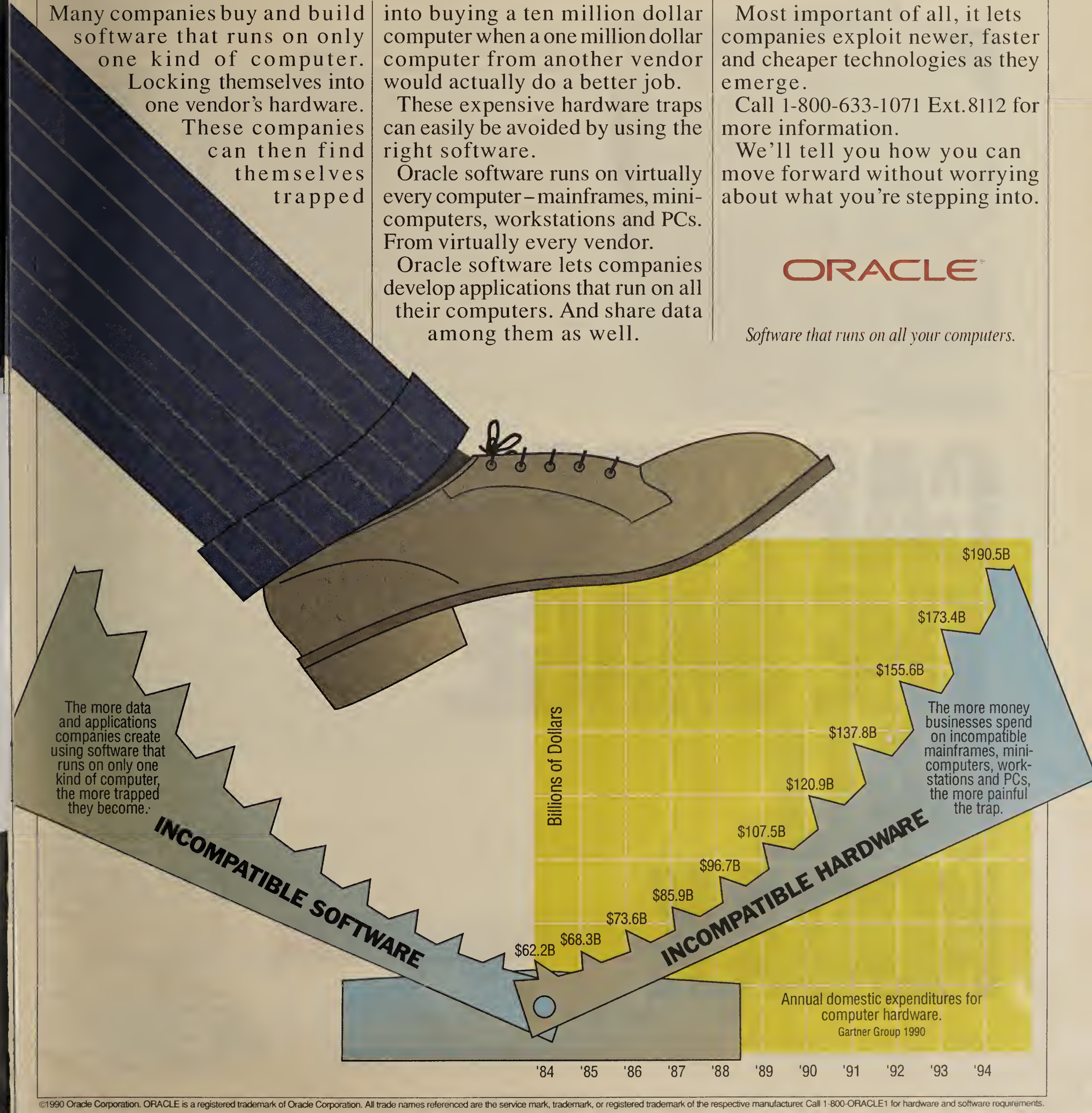

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VDT tones may cut productivity, study says

BY ELLIS BOOKER
CW STAFF

EVANSVILLE, Ind. — The hum of hard-working office staffers is not the only noise in corporate America. Listen carefully to the computers these workers use, and you will detect a high-pitched squeal.

That barely audible signal — a 16-KHz pure tone emanating from some VDTs — can be especially irritating to women, according to two researchers.

Douglas Covert and Caroline Dow, both assistant professors of communication at the University of Evansville, said that women exposed to the noise made more errors and were more prone to headaches and other stress-related complaints than women who were not exposed to the sound.

The findings were reported earlier this month in Minneapolis at the national convention of the Association for Education in Journalism and Mass Communications, an academic association based at the University of South Carolina in Columbia.

The study detailed two experiments conducted by Dow and Covert and suggested that female workers can be affected by the sound even when they do not consciously hear it.

"Women in our [journalism] classrooms were having difficulty two years ago when we transferred from typewriters to computers," Covert said. What had been a pleasant classroom became a tense one. The women were complaining of headaches, fatigue and irritability, he said.

Some of the women students actually complained about the noise, which Dow could hear but Covert could not.

Covert and Dow conducted a literature search on women, noise and computers in the workplace but found little background on the psychological impact of VDT noise. "We did find references to the greater sensitivity of women to sound," Covert said. Women can hear tones that are 1- to 3-KHz higher than those men can detect, and in general, women hear noise at roughly half the loudness of men.

> THE STUDY found that the group exposed to the sound had an 8% productivity loss compared with the control group.

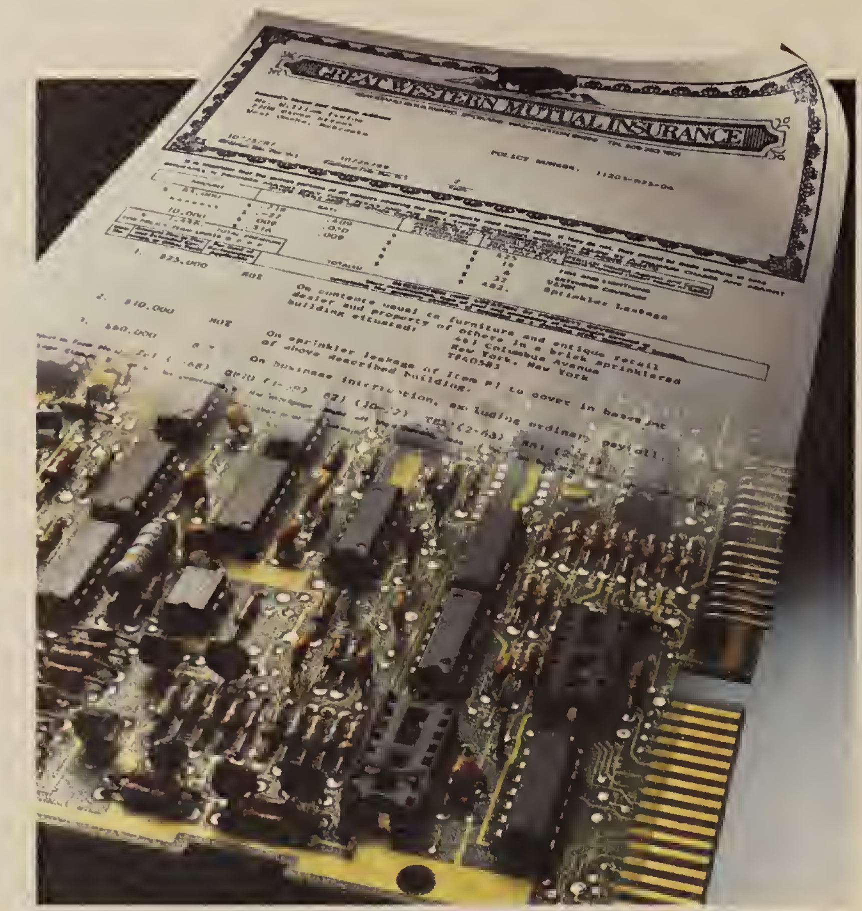
The first of the two studies, conducted in April 1989, exposed a classroom of women students to the tone raised to the level of normal conversation. The researchers then compared the group's performance without the noise, which was produced by an electronic tone generator. The students, who were performing clerical tasks during the test, made twice as many mistakes, the researchers found.

In March, the researchers conducted a second test involving 100 female students. The women took a simulation of the Graduate Record Exam. Half were exposed to the tone during the test; half were not.

The study found that the group exposed to the sound had an 8% productivity loss compared with the control group.

Bruce Dickerson, executive director of the not-for-profit Center for Office Technology in New York, which reviews ergonomic studies on VDTs, said he was unaware of similar studies on the effect of VDT noise and stress.

"They have to report on their methodology, conclusions, data and recommendations," Dickerson said. Other scientists will have to review the research and replicate the experiments before Dow and Covert's work can be evaluated properly, he added.



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EDS speeds Chicago parking ticket collection

BY ELLIS BOOKER
CW STAFF

CHICAGO — This city's backlogged parking ticket collection system, described by its own administrators as the worst in the nation, is being towed into the next century.

Electronic Data Systems Corp. (EDS), which began handling the data processing side of the ticket operation in late July as part of a five-year, $40 million contract, is also revamping the troubled computerized system, adding such state-of-the-art components as radio-frequency data terminals for crews in the city's "Denver boot" patrol trucks and equipping enforcement personnel with handheld computers and portable printers.

However, the new system's most unique element will be an imaging subsystem that will permit on-line access to the 12,000 to 15,000 parking violations the city issues each day.

"Chicago's [parking system] is about the worst of any big city," city parking administrator Inge Fryklund said. She added that she has high hopes for the imaging portion of the system — the first of its kind in the country.

Chicago had plenty of incentive to try to leapfrog other cities. Its parking system reportedly has a backlog of hundreds of thousands of overdue tickets; $50 million worth of fines go uncollected each year.

The total cost of the old system, including the keypunch and trafficking personnel, was $13 million. "We'll be paying $8 million annually to EDS instead of $13 million," Fryklund said.

Chicago residents may also appreciate the swift justice the new system promises. Instead of the whopping six-month lag time between when a ticket is issued and when it is keypunched into the computer system, the EDS contract stipulates that tickets must be entered into the image database within three days.

To make that possible and to automate other functions of the new system, Chicago will shift to a new parking ticket form containing machine-readable codes next month. The codes will enable the new system to generate detailed management reports showing city officials where tickets are being written, where parking meters are breaking down and which hydrants are attracting the most cars.

Until now, ticket information has been entered (or sometimes not entered) on 1957-vintage keypunch terminals — part of an old punch card system that was later converted to a batch tape system.

The image database, which will also contain correspondence from citizens, will be accessed from 14 Sun Microsystems, Inc. workstations at City Hall, the existing traffic court building and three remote locations around Chicago.

EDS replaces Computil Corp., a Clifton, N.J.-based service bureau that provided information systems services for the old system.

"The employees who were in data processing are being recycled into information processing clerks for the [ticket] hearing centers," said Michael McGowan, deputy director of revenue in charge of planning for the city of Chicago. McGowan said that no IS layoffs were caused by the outsourcing deal with EDS. "As a matter of fact, we're asking for a few more people," he said.

Next year, Chicago expects to issue about 4.5 million parking violations.

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Power returns to lower Manhattan

BY JOHANNA AMBROSIO
CW STAFF

NEW YORK — The lights are back on and most businesses have returned to their data centers after the week-long blackout that hit lower Manhattan on Aug. 13.

"The worst is over," said Richard Zane, president of Comdisco Disaster Recovery Services in Rosemont, Ill. "Only one of our customers is staying until the end of the month, and we have no more active alerts."

A spokesman for Consolidated Edison, New York's electrical utility, said, "Everyone is back on Con Ed power. No one's on restrictions, and no one is on generators."

Full power was restored last Monday, but it took a few days for everyone to get back into their data centers. About half of the 20 companies that went to hot sites were in them for seven days or more.

Direct losses and associated costs from the blackout may run into the millions of dollars, observers said. "It's going to take a while before the bottom line is clear," said Robert Campbell, president of Advanced Information Management in Woodbridge, Va. "But so far, it's looking like at least $100 million."

He, as well as several others, suggested that legal action against Consolidated Edison may be one remedy being considered by the firms with the hardest hit data centers. Two firms have already filed lawsuits against Consolidated Edison because of the power outage, but neither lawsuit was specifically computer-related.

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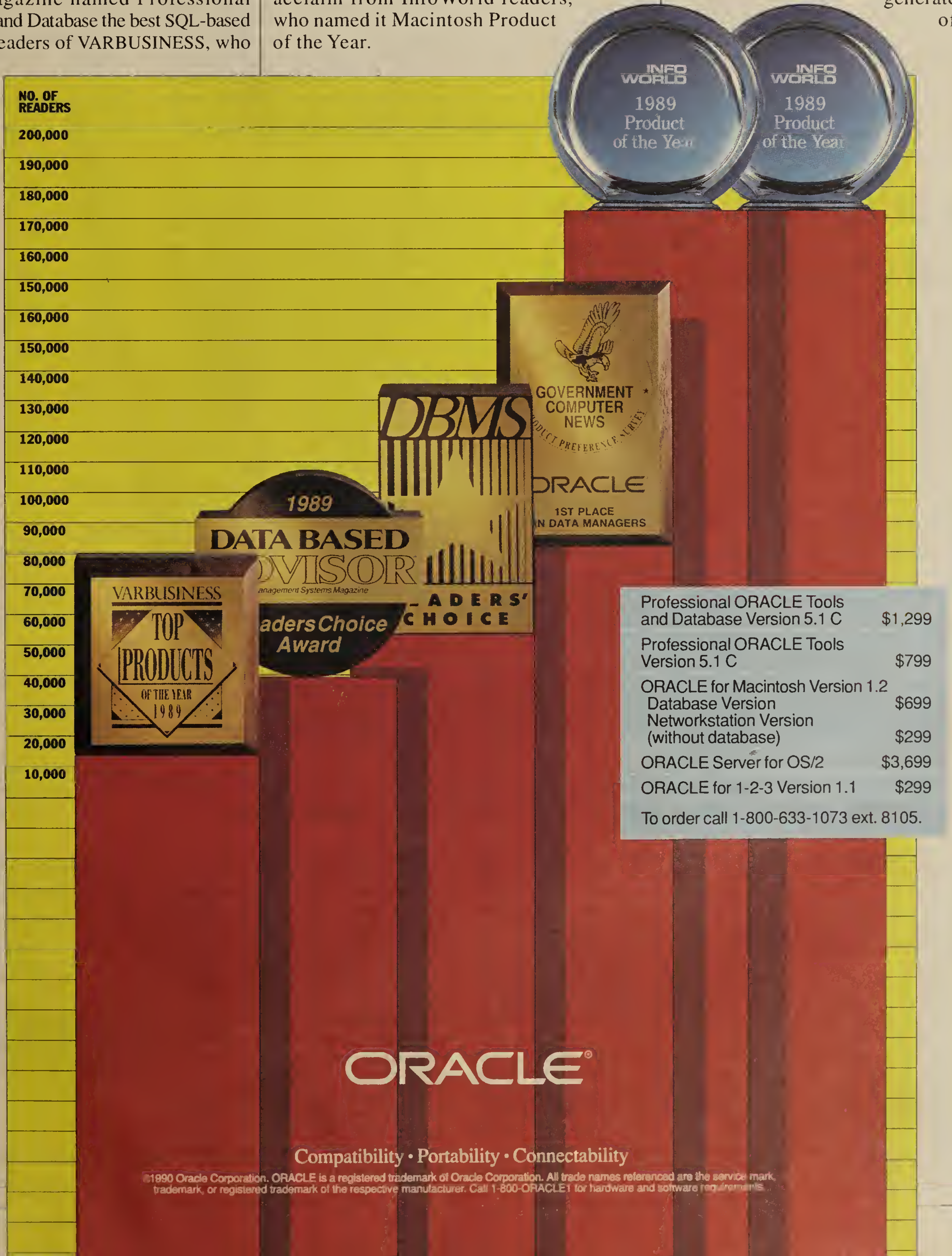

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It's all Cyber systems go for Soviets

With export license in hand, CDC and USSR officials ready for mainframe sale, safeguards

BY ELLIS BOOKER
CW STAFF

MINNEAPOLIS — Control Data Corp. received a green light from the U.S. Department of Commerce last week to export six mainframe computers to the Soviet Union.

The Cyber 960 mainframes, which will be used to analyze safety factors in Soviet civilian power plants, are the most powerful computer systems ever sold to the Soviets.

CDC has been awaiting an export license for the machines since last November. The Soviets will pay $32 million in hard currency for the systems, according to the company, which will deliver three systems this year and three in 1991.

Soviet interest in the sale was underscored in June, when Soviet President Mikhail S. Gorbachev stopped at CDC's headquarters here for a brief demonstration of the Cyber 960. CDC was the only U.S. company visited by the Soviet leader during his U.S. tour.

In June, the Coordinating Committee on Multilateral Export Controls (Cocom), the international trade watchdog organization, liberalized its rules for computer sales to the Soviet and Eastern Bloc nations [CW, June 11].

Under the revised rules, Cocom has 20 days to file an objection once it receives an application for a high-end computer sale to the Soviet Union or East Bloc nation.

This month, the U.S. and Soviet Union agreed on usage safeguards for the mainframes, which have a performance rating of 435 and fall into the second of three performance tiers established by the new Cocom rule. Last Monday, when the 20-day waiting period ended without a Cocom objection, the Commerce Department approved CDC's export license.

The Cybers will be controlled under an agreement reached in June between the U.S. and Soviet governments over the use of the CDC computers. The accord specifies various safeguards, including onsite visits during which usage logs of the mainframes will be checked, and other safeguards built into the computers themselves.

A CDC spokesman said the firm hopes to see increased computer business with the Soviets. The day Gorbachev visited CDC's headquarters in June, the firm signed a technology sharing agreement with the USSR's Academy of Sciences under which the two will explore computer applications in five areas: nuclear safety, petroleum exploration, electric power generation and transmission control, software development and workstations.

Prime adds RISC systems and Unix version of DBMS

BY SALLY CUSACK
CW STAFF

NATICK, Mass. — Prime Computer, Inc. moved to fulfill promises to its customers for more Unix-based products when it showered the market last week with a mixture of new processors and a Unix version of its Information database management system.

With the unveiling of Prime Information Plus, the long-awaited Unix version of its DBMS for transaction processing, the firm launched its EXL 7000 series of reduced instruction set computing (RISC) processors. The software has been optimized to run on the new Prime platforms.

Aimed at commercial Unix users with heavy transaction processing requirements, the new binary-compatible processors are available in four configurations — the EXL 7330, 7340, 7360 and 7680 — with performances ranging from 25 million instructions per second (MIPS) to as much as 68 MIPS, according to the company.

The new RISC family supplements Prime's existing line of complex instruction set computing Intel Corp. 80386 Unix machines. Prime will continue to market its entire line of EXL products.

Michael O'Rear, a beta-test site user at the University of Southern California in Los Angeles, was especially impressed by the ease of both the hardware and software installation. O'Rear, who is currently running the PI Plus database on an EXL 7340, said that the system was up in a matter of hours. He said he finds it "extremely easy" to port applications over to the RISC platform. USC has been running Information on Prime 50 series machines for almost 10 years.

"We're not planning to drop our 50 series, but this does give us an escape valve if we ever want to move, or are forced to move, to an open systems environment," O'Rear noted.

According to Richard B. Snyder, president of Prime's Computer Products division, the EXL 7000 series will be marketed through both direct channels and value-added resellers in the U.S. The systems are the result of a technology partnership with Mips Computer Systems, Inc. in Sunnyvale, Calif., and will use Mips technology at all levels of integration.

Information is a Pick Systems'-compatible, fourth-generation language software package that has been available to Prime 50 series users since 1978. Prime is positioning its new Unix offerings to take advantage of the 4,000 Pick applications currently in the marketplace.

"Most of the other Unix boxes out there run systems-related software. The EXL 7000 series is more geared toward actual end-user, commercial applications," Snyder said.

Networking functions reportedly include Transmission Control Protocol/Internet Protocol, Network File System and X.25 protocol capabilities.

Available for immediate shipment, the entry-level EXL desk-side server supports as many as 100 users and is priced from $18,000, while the EXL 7680 is capable of supporting up to 500 users and is priced from $150,000.

Two execs opt out of MCI management reorganization

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — MCI Communications Corp. shuffled its management deck last week but lost two of its top cards.

Nathan Kantor, president of MCI Northeast, one of seven regional divisions, resigned to start a telecommunications consulting firm. He is succeeded by Jonathan C. Crane, formerly president of Atlanta-based MCI Southeast. Crane's post is going to Douglas L. Main, previously senior vice-president of finance.

Ronald E. Spears, president of the Chicago-based Midwest division, resigned rather than relocate to a new post at MCI's headquarters here. His job will go to Gregory A. LeVert, formerly vice-president of large accounts.

"I want it to be a high-quality telecommunications consulting and implementation firm, with the emphasis on implementation," Kantor said of his new venture. He said he hoped to help managers who are befuddled by galloping technology, international upheavals and a troubled economy.

Kantor said his firm will assist other firms in developing or improving network strategies. The company will also specialize in international telecommunications, helping U.S. firms establish overseas partnerships, especially in Europe.

He would not discuss the firm's initial financing or staffing.

"I've been thinking about this for some time," Kantor said. "The toughening economy has pushed me a little faster. Some would say it's not a good time to do this, but I'd say now is the best time."

Kantor acknowledged that he would have to be careful to ensure objectivity in advising clients about the use of telecommunications services such as those provided by MCI. "But 99% of the other consultants out there came from AT&T, so maybe I'll bring some balance."

MCI also announced that O. Gene Gabbard will assume the title of executive vice-president and chief financial officer and will head MCI's corporate development department.

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Danbury	10/23
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Washington, DC.	11/6
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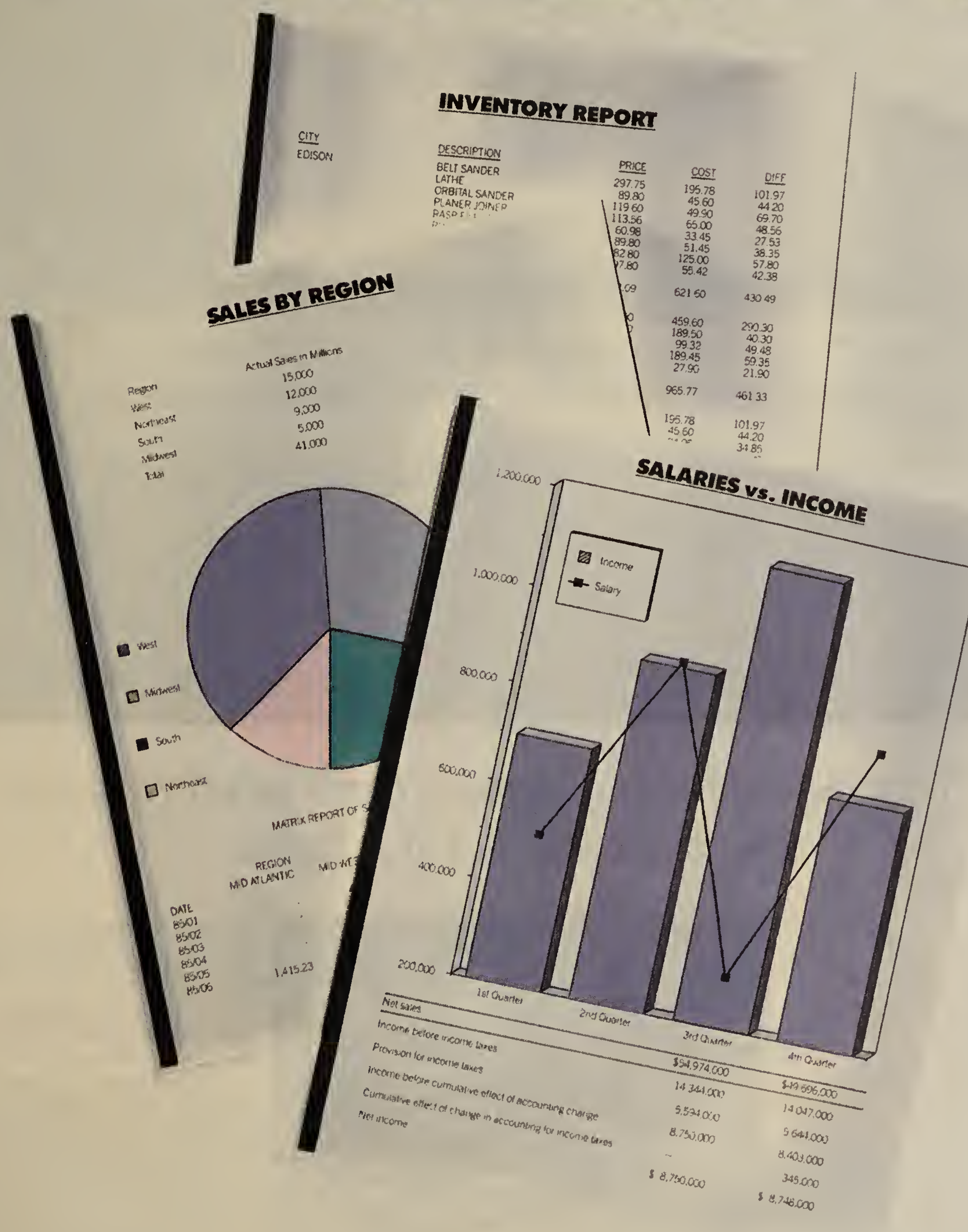

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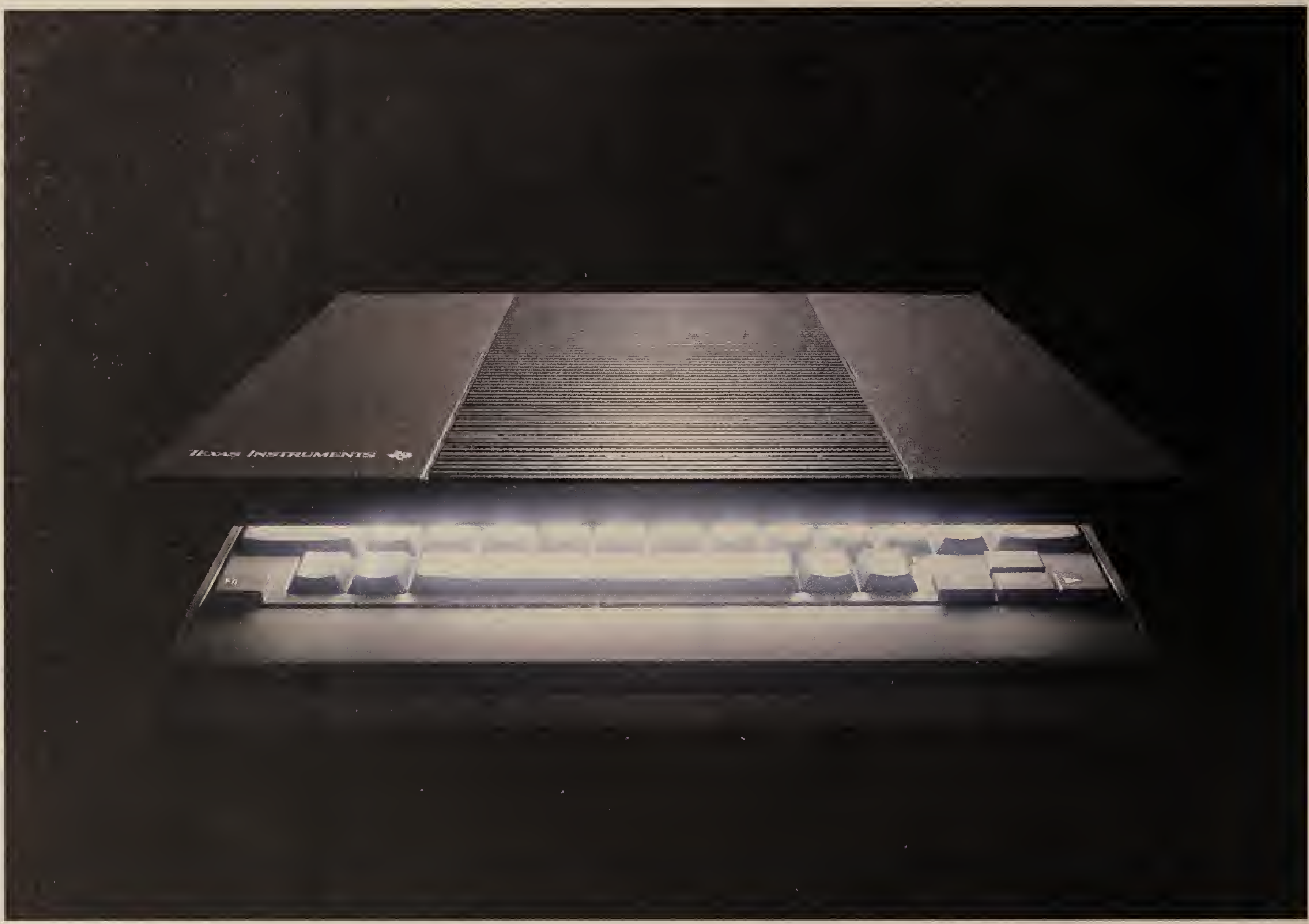

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ADVANCED TECHNOLOGY

The ghost in the museum is a machine

Museums use computer technology behind the scenes to entice, educate and entertain museum visitors

BY ALAN J. RYAN
CW STAFF

Duck!

Technology is the culprit when a visitor to the Smithsonian Institution's National Air & Space Museum gets hit in the head by an airplane. A computer-controlled robot of the type used in aircraft manufacturing plants has been programmed to make paper airplanes and send them out over the crowd of visitors who flock to the museum in Washington, D.C., each day.

However, computer technology has become more than just a zany or intriguing component in our nation's museums; technology has become integral to the new museum culture and is often seen as a necessary tool to attract visitors to the museum and hold their interest after they arrrive.

At the National Air & Space Museum, computers were a long time in coming but are essential now, spokeswoman Joyce Peterson said. "Computers have so entirely taken over the field of aviation that it was imperative we do it."

Historically, science and technology museums have been the first to recognize high technology, said Ann Mintz, special projects director at Philadelphia's Franklin Institute. "The first computer was placed on the floor at the Franklin Institute in 1958."

In today's museums, however, the computers have become a function of the exhibit rather than the exhibit itself, and they are used interactively by museum visitors.

At COSI, Ohio's Center of Science and Industry in Columbus, many exhibits would not be possible without computers, said Heather Weigand, one of the museum's directors.

COSI is using multimedia — the blending of video, sound, graphics and animation — to motivate children to learn more about science and math, Weigand said.

COSI is currently putting the finishing touches on its "Mission to Mars," a $1.8 million, 5,000-sq-ft exhibit that will be on display from Dec. 26 through May 11, 1991, prior to embarking on a two-year national tour.

The exhibit consists of three sections:

- Three thousand square feet of the exhibit is devoted to science exhibits related to Mars. Visitors can retrieve information about the exhibit from 28 Apple Computer, Inc. Macintosh computers, donated by Apple.
- The second segment of the exhibit consists of a Mars habitat simulator, consisting of a network of computers linked to laser video discs. "It will link sound, graphics and animation to simulate a trip to Mars and give visitors a taste of what scientists on the red planet might do as part of their research," Weigand said.
- The third part of the exhibit is a "manned Mars outpost," where the visitors walk onto the simulated planet and take part in creative problem-solving activities.

Museums *display visitor-hooking graphics*

Computers make the entire museum experience more memorable because they can help to explain complex topics in a visual and accessible way, Peterson said.

The Air & Space Museum boasts two levels of computer monitors — one set at the eye level of the user and another positioned four feet above it so other visitors can view the information, too.

"A lot of people have the stereotype that museums are stodgy, stuffy, not very up-to-date places," said Carol Hagglund, museum educator at the Roger Williams Park Museum of Natural History in Providence, R.I. "We're trying to come into the modern world."

At the Roger Williams museum, Hagglund said, a grant from Apple Computer will bring multimedia technology to two dioramas — life-size exhibits of wildlife specimens and landscape with natural-looking surroundings and a painted background. The computers will "show motion and illustrate some of the things that the static nature of the exhibit does not allow visitors to see," Hagglund said.

The animated videos accompanying the exhibits will give visitors a choice of information they want to retrieve. For example, a visitor can view birds flying and horseshoe crabs molting or can find out how some animals gather food.

"It's a new way of looking at one of the oldest exhibit formats in a natural history museum," Hagglund said. "And it is also a way to teach the children." The museum, currently under renovation, will reopen this fall with the new displays in place.

Another system being put in place at the Roger Williams Museum is a two-part environmental issues project that will show the environmental impact of man's action on Narragansett Bay. Through animated sequences, the computer at the museum will show the impact of sewage overflow and treatment, road runoff and other pollutants on the bay, Hagglund said.

The second part of the environmental impact system will be a live monitoring of water conditions in Narragansett Bay. A monitoring station will measure the levels of dissolved oxygen, pH levels, salinity and water temperature. The interpretation of the data will be done on a Macintosh, Hagglund said.

An interface that stands up to Bart Simpson

BY JOHANNA AMBROSIO
CW STAFF

At the Franklin Institute Science Museum in Philadelphia, the user interface is the thing.

Designers of the museum's new museumwide computer system, which went on-line in May, faced a daunting task: how to implement a system that would be used and understood by a diverse range of adults and children to help them learn about and explore the exhibits in a fun and natural way. The computers are also used to answer questions about museum hours, attractions and facilities.

The machines needed to withstand abuse by the museum's 750,000 visitors each year; bubble gum on the screens is not an uncommon occurrence. "Some of the kids are real Bart Simpsons," said Ann Mintz, the museum's director of special projects.

In response to those challenges, the Franklin installed a network of some 28 Unix-based workstations throughout 11 exhibits, each of which has a touch screen, color display and bar-code reader. The workstations are on tilt platforms to make them accessible to people in wheelchairs and to people of different heights. By the end of the year, there will be 42 computers in 20 exhibits. The network ties the workstations to Unisys Corp. hosts running Unisys Mapper.

Upon entering the museum, each visitor receives a card with a bar-code number. To operate the workstation, the visitor runs the card through a reader or simply touches an area on the screen that is of interest. Printout options include information about a specific topic, how to find out more about something and games and projects for children to do at home.

Franklin Institute's *computers are used by 750,000 visitors each year*

At each workstation, information is delivered at adult, child and preschooler levels. Once a level is selected, the screen changes to reflect that level. Children, for example, might want to play a game about aviation, and adults can elect to answer an interactive poll about the environment. People can change levels if, say, an adult wants to tour on a child's level or vice versa.

The interface is similar at each level: Users touch boxes containing the information they want to know or the answers to games and poll questions. At the bottom right of the screen, three icons remain constant: a finger pointing forward to go on, a finger pointing backward to go back one screen and a stop sign. Touching the stop sign returns the user to the main menu most recently accessed.

Extreme care was taken to design all the screens, to figure out the maximum number of words and word placement and to map the display correctly so that when a visitor touches something, the proper information is given.

"We have about 10 seconds to get people's attention. If they're not successful in that time, they just walk away. There can't be a learning curve," Mintz said.

One way the museum can find out how much the computers are used is by analyzing data about who uses which portions of the system and how far they get. "We're not doing a lot of analysis now, but we can when we're ready to," Mintz said.

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EDITORIAL

Some things old

IS IT SOMETHING in the water or something in the air?

Lately, we've run a number of stories with a back-to-the-future twist. For example, a lobbying effort by dedicated users of the HP 1000 line (a quarter-century-old line, at that) has goaded Hewlett-Packard into committing over the next 20 years to a processor that has little to do with HP's essential RISC strategy.

We've also reported on the sizable groups of loyalists to such "dinosaurs" as the DEC 10s and 20s and early models of its venerable PDP-11 mini line, as well as IBM's System/36. Then there are the millions of PCs in use based on Intel 8088, 8086 and 80286 processors.

What's wrong with these users? Are they the same Luddites who led the movement for repudiation of advanced technology by rejecting OS/2 as a replacement for MS-DOS? Is it the same group that is clinging so tenaciously to proprietary offerings just because those products are often so much more robust than the plain vanilla "standard" products that are so frequently served up these days? Just because a product gets the job done, is that a good reason not to scrap it and move on to the next generation?

There are plenty of good reasons to explore and exploit advanced technologies, with corporate survival by way of a well-planned IS strategy the foremost one. But there is no small gulf between the pace at which the vendor community is bringing new technology to market — sometimes at the expense of maintaining very solid product lines — and the rate at which customers are willing to absorb that technology.

At a press/analyst meeting a few months back, Lotus CEO Jim Manzi was asked to assess the role of the IS manager in the early 1990s. That role and its influence on the entire IS structure, he said, will increase. But he was hasty to add that he and Lotus weren't exactly happy about that, because IS tends to be relatively slow when it comes to approving purchases of new technology. This sentiment has been echoed by others at Microsoft, Ashton-Tate and so on.

We have to agree on both counts. In the corporate networked environment, a high degree of central orchestration is essential to achieve the levels of integration needed to truly exploit the prodigious technology investments that have been made. And yes, the IS conductors will do very well to proceed with methodical prudence every step of the way.

As for the vendors, just consider what happened within the auto industry. The Detroit car makers grew fat a generation ago on an auto-buying public that liked to trade up every two or three years. Along came the oil crisis of 1974, and buying habits changed. Detroit did not. It eventually relinquished enormous market share to foreign competitors, who came at the market with efficient cars that were built to last. Today, those foreign manufacturers, who fed the market what it wanted years ago, are taking over the leading-edge high end of the market as well. It seems everyone has gotten what they deserved.

LETTERS TO THE EDITOR

Concurrent

Congratulations on your new monthly series [CW, July 23] reviewing products in the application development arena. We're pleased to have had the opportunity to test Nomad in a well-constructed benchmark that accurately reflected "real-world" application requirements.

While we appreciate the attention given to describing specific product functions, we hesitate to leave unchallenged some overall impressions that may be left with the reader. Your reviewers have drawn speculative conclusions with regard to Nomad's suitability for concurrent development of large, complex applications that are not consistent with Nomad users' experience with the product. Many of them use Nomad effectively in multiperson development teams for applications whose complexities far exceed those of the benchmark.

Abby Pinard
Vice-President, Marketing
Must Software International
Norwalk, Conn.

Standards matter

Rep. Richard Gephardt's Viewpoint article [CW, Aug. 6] points out the need for international standards for communications among different computer systems and standards for the security of computer systems and their data.

Just as a matter of clarification, the Department of Defense, in conjunction with both domestic and international industry, has been aggressively and successfully working toward such a goal for years. In the article "Easing paperflow could help slash DOD budget," [CW, Aug. 14] the initiative referred to as Computer-Aided Acquisition and Logistics Support, or CALS, is encouraging standardized international trading practices in the Information Age.

CALS is a strategy designed to effect an evolution from the current paper-intensive process of product development to a highly automated method of operation, thus eliminating the roadblocks caused by incompatible islands of automation. In addition, as a member of the DOD CALS Industry Steering Group, we understood all along that the right information in the wrong hands could prove disastrous; consequently, computer security is an important feature.

Paul N. Pechersky
Vice-President, MIS
ICL, Inc.
Irving, Texas

Needed detail

Regarding your recent column, "IS needs to learn rules to play innovation game" [CW, Aug. 6], Mr. Ognibene's "Viewpoint" was typical of the consulting world we "muzzlers of innovative solutions" face daily.

I note no mention of cost-effectiveness in his proposed smart-card solution ramblings about the evils of information systems departments and their roles in corporate America. Rather, his complaint, more directed at difficulties in securing his "daily bread," is sour grapes about several failed efforts to introduce the wonders of "innovation" to several concerns. My role, and that of IS executives, is to ensure that information technologies are applied to earning our respective employers' profits, not introducing innovation.

In his examples lies a clue to why these miraculous solutions were not adopted posthaste. In the hotel scenario, Mr. Ogibene gives us just enough information to see that the depth of his proposal is indeed typical for the gunslingers of consultant-dom; how were these spreadsheets to be reported centrally? The other example lacks details, but large-scale inventory systems require a level of expertise and detail not evident in this viewpoint.

Marshall J. Huntenburg
AVP Data Center Services
GAB Business Services
Parsippany, N.J.

Fool me once . . .

It's really great to read that Peter Bartolik loves his PCjr with its nifty design features, which he was able to pick up for a close-out $400 [CW, July 2]. Admittedly, he does not think the IBM PS/1 will make it. Good thinking! It was a loser from the time I opened the box, as testified by IBM, which made the machine obsolete six months after I purchased it. To add insult to injury, Computerland, the distributor of my giant paperweight, refused to offer any help. Scotty of Star Trek said it best: "Fool me once, shame on you. Fool me twice, shame on me."

Jerry Amancio
Manager, Data Processing
Carlyle Johnson Machine Co.
Manchester, Conn.

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Slow the push to judgment

MITCHELL KAPOR

The more closely we look at the "problem" of computer hackers, the more we need to be wary of quick judgments and shortsighted solutions.

In a recent case, the press reported that highly confidential material about the operation of the 911 emergency system was removed from Bellsouth Corp.'s computer network as part of a plot to disrupt 911 services. The material was variously described as computer control software, telephone access codes and even a computer virus. These news reports were based on accounts from government prosecutors, Secret Service agents and Bellsouth officials.

Craig Neidorf, the defendant in the case and the publisher of an electronic newsletter, was indicted on felony charges of wire fraud and interstate transportation of stolen property. Neidorf had published a document that someone else had removed, without his knowledge, from a Bellsouth computer.

When the Electronic Frontier Foundation (EFF) was formed last month to protect the First Amendment rights of computer users, some reporters misconstrued its purpose as an attempt to defend malicious computer break-ins. Ignored was EFF's clear position that unauthorized entry into computers is wrong and should be punished. The press also discounted EFF's claims that the government prosecution of computer crime had gone too far in the Neidorf case. We were told instead to wait until the facts came out.

We waited. On the fourth day of the Neidorf trial, the prosecution dropped the case after it became clear that the "highly confidential" Bellsouth document was publicly available. In fact, it could be ordered from Bellsouth for $13.

The EFF was instrumental in this outcome. We located the expert witness who found publicly available information that contained all the material in the disputed document. Without our participation, Neidorf may well have gone to jail for the act of simply publishing information.

Justice was served by the government's decision to drop the case, but it was expensive justice. Neidorf and his family face enormous legal bills for an action that never should have been brought against him. The prosecutors relied on Bellsouth's claims and failed to do independent research, which could have easily shown that Bellsouth's allegations could not be supported. More independent verification must be required before initiating criminal proceedings.

Bob Dahm

In a second case, the EFF assisted Steve Jackson, a game manufacturer in Austin, Texas, who suffered substantial business losses after a Secret Service raid in early March. No charges were ever brought against Jackson or his company. We helped him recover his equipment after it had been seized by the Secret Service. We are also trying to get the warrant unsealed so we could determine the reason for the investigation that forced Jackson to lay off half of his staff.

People who break into computer systems and cause harm should be held accountable for their actions. The punishment should match the seriousness of the act. Just as the law makes a clear distinction between trespass and burglary, we need to make appropriate distinctions among the various forms of computer crime, based on facts such as intent and the degree of actual damage.

In some instances, it may be necessary to create new criminal laws to discourage new types of crime. For example, the EFF supports an amendment to computer crime law that would punish people who engage in reckless acts with computers.

At the same time, network operators must also be held accountable for the management of a network and should put in place adequate security measures to protect both private users and corporate data. Blaming hackers for all forms of computer abuse is a shameful evasion of responsibility. Creating scapegoats will not improve system security.

Computer users need to know that their use of computer networks for information and communications purposes is secure from unwarranted intrusions and interference by anyone, whether a private party or a government agent. This requires not only the proper laws and the intelligent application of those laws, but also the development of a broad public understanding of benefits and responsibilities that come with modern computing and telecommunications technology.

EFF has funded a significant two-year project on computing and civil liberties to be conducted by the Computer Professionals for Social Responsibility. We aim to educate policymakers about the civil liberties issues that may lie hidden in the brambles of telecommunications policy. This process — not midnight raids at gunpoint — will help shape public policy that is sensible, reasoned and well-informed.

Kapor is the chairman of On Technology and the co-founder of the Electronic Frontier Foundation.

American business must seek out the longer view

ROCCO J. MARANO

America has proven its business acumen in many subindustries such as telecommunications equipment, computers and semiconductors. But we suffer from a nagging inability to put all of these together into a coordinated, far-reaching initiative.

The challenge that information-related business and enterprises face today, and the challenges to America's overall technological competitiveness, are largely internal issues. Some of the most difficult potential roadblocks are rooted in longstanding domestic traditions.

Isolationist views, archaic regulations, short-term management mentality, the pursuit of excessive financial gimmickry and a troubled public educational system all threaten America's position as a technological leader by endangering our ability to integrate our resources.

There exists a tremendous opportunity for U.S. businesses to exploit and build on America's technological and industrial strengths. If we make the right choices now, people will have access to new kinds of information and be able to create new knowledge, wealth and entertainment. America's telecommunications infrastructure is key to this vision of the future.

Americans are already taking advantage of many advances and have started to make changes in the way they gain access to and use information. They have bypassed public telephone networks when those networks did not meet their needs. But as they have become accustomed to pieces of the future, they have come to expect the rest of the future to fit together nicely in one vast technical quilt.

However, it does not yet fit together well, and Americans are beginning to ask why not.

In the U.S., we act as if we are an island economy, largely independent from the rest of the world. In more lucid moments, we know that is not true. But our national view of such matters was formed when it was true.

In management, many continue to strive for short-term profit, believing that value to shareholders is equivalent to next quarter's earnings. Short-term "quarterly profit" management concentrates on what a firm has, instead of what it can create. It can add, but it can't dream.

A little of both

I'm certainly not suggesting that we concentrate on dreaming and forget how to add. But look at how many technologies pioneered in the U.S. have been turned into products in other countries and sold back to us as imports. We need to reshape the journey from laboratory to market without diminishing the importance of either.

Ironically, our nation's laws make total cooperation almost impossible. U.S. antitrust laws were written to ensure fair competition in an isolated, independent economy — something that no longer exists. U.S. companies compete in world markets; if they are to compete effectively, they must be able to cooperate upstream from the marketplace.

In telecommunications, a critical arena for fueling the information age, regulation was designed to ensure basic or "plain old telephone service" — service that was reliable, universal, affordable and nothing more.

The world just doesn't look like that anymore. Regulation that assumes it does stands in the way of progress — economic and social, as well as technological. But there are hopeful signs. For one, bills are pending in Congress that would move jurisdiction over the 1982 decree that broke up the Bell System from the court to the Federal Communications Commission. That decision still prevents the regional Bell holding companies from designing, manufacturing or providing information services.

The U.S. government also has no coordinated strategy for technology. Instead, we have an ad hoc, disjointed policy scattered among nine congressional committees, four congressional support agencies, 14 executive branch departments, dozens of executive branch agencies and 51 state regulatory bodies.

In contrast, our chief international competitors have coherent national policies embedded in civilian agencies. Though the Japanese have their own problems in this area, their Ministry of International Trade and Industry plays a major role in targeting the coordination and funding of Japanese efforts in high technology.

It is this national approach that enables some other industrialized nations to take coherent, strategically advantageous positions during multilateral and bilateral negotiations. The U.S. does not have a single telecommunications or information/technology policy; consequently, it has been more difficult for us to achieve a unified national point of view.

We still have time to direct our future and better prepare for the 21st century. There are some things that industry and government must do now to make that happen.

- Industry can expand the frontiers of fundamental technologies through much greater upstream cooperation — and government can amend its antitrust laws to allow it.
- Industry can continue good standards work that has been done — and work toward streamlining the process by which we arrive at a viable international standards position.
- Government can lead the way to a national information technology policy — and revise laws and regulations as needed to support that policy.
- Both government and business can make a greater investment in improving the quality of public education and encouraging more youngsters to take on the scientific challenge.

We can choose to be technological followers, living on mutually incomprehensible islands. I cannot believe we would consciously make that choice. Yet, that is the future being shaped by our individual motives. There is a better choice.

Marano is president and chief executive officer of Bellcore.

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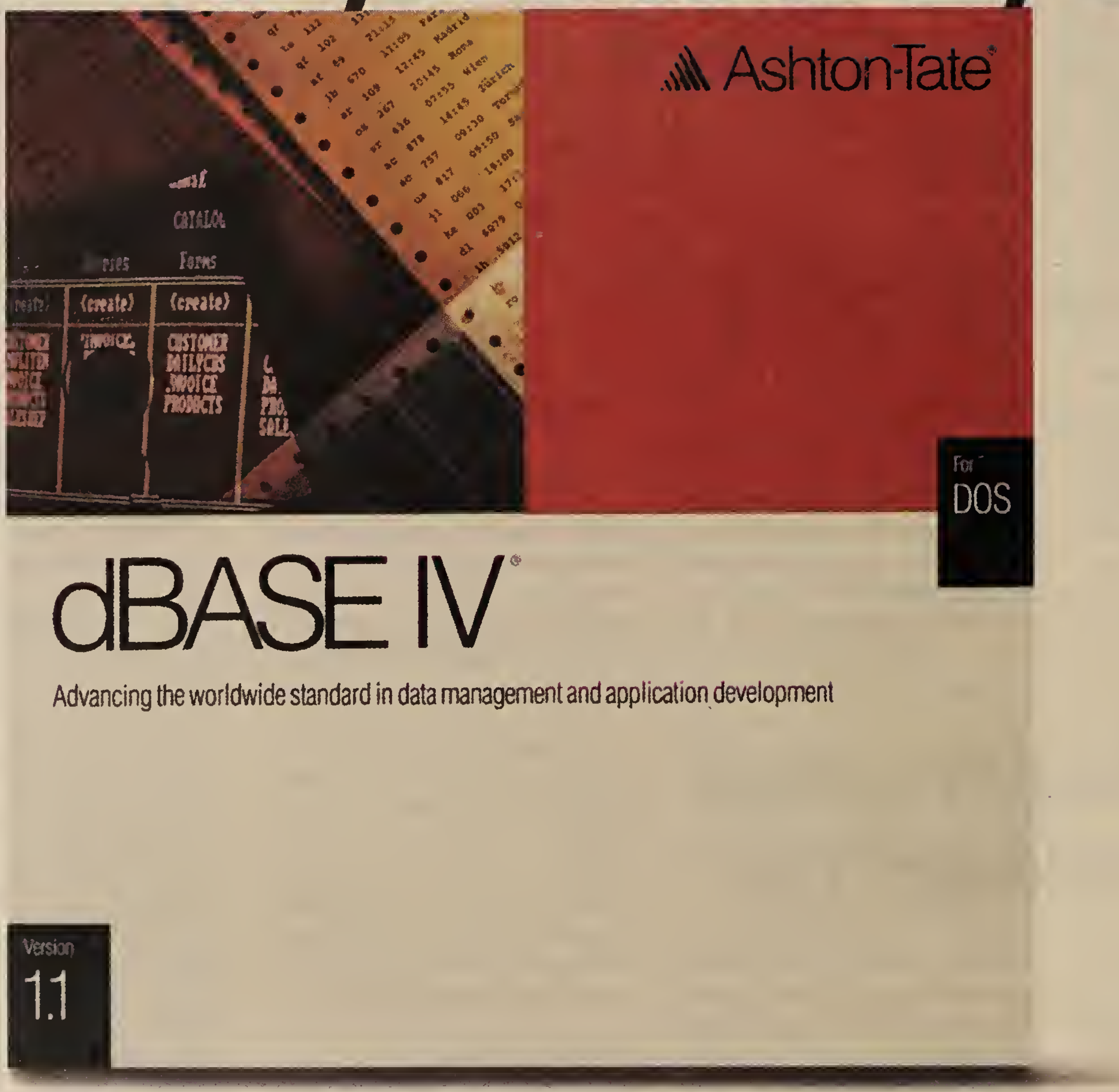
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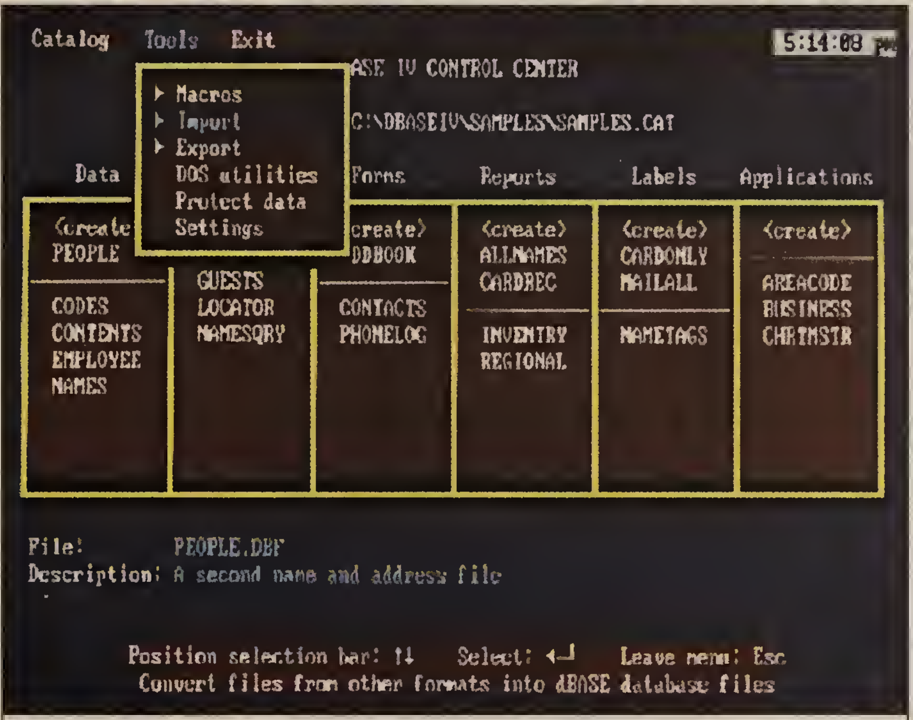

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SYSTEMS & SOFTWARE

COMMENTARY

Robert L. Glass

Crisis? What crisis?

I have always been uncomfortable with the notion of "the software crisis," the belief that software is always behind schedule, over budget and unreliable. Part of my reaction was emotional — as a practicing software professional, I was offended that someone would say we were not doing a good job.

Part of it was logical — if there truly is a software crisis, then how can we send vehicles into space? How can we run our banking system with computers? How did we create a multibillion-dollar software industry?

My emotional response boiled over a few months ago when I saw how people were using the data from the U.S. General Accounting Office (GAO). You've probably seen the data — a horrendous percentage of projects were never successfully completed. Speakers and writers began using the GAO data to prove there was a software crisis.

But there was a problem with that data: The projects studied by the GAO were not random choices. They were selected because they were in trouble. In other words, the GAO study concluded that many troubled projects are never completed successfully. That, of course, is self-fullfilling prophecy.

I would like to assert that the software crisis has been

Continued on page 32

Foggy mainframe picture stalls user plans

ANALYSIS

BY ROSEMARY HAMILTON
CW STAFF

It all depends on where you sit.

Throughout the summer, the expected announcement of IBM's next-generation mainframe has been great sport for industry observers as they speculate on what it will be.

But for some information systems managers, the same period of time has been much more of a hassle, with managers having to make capacity plans with a big question mark. While some managers may have been briefed to varying degrees on IBM's product plans, not all have been privy to such briefings.

Several IS managers contacted recently said their goal is to position themselves so they do not get hurt. Not only will the announcement put new systems on the market, but it will likely rearrange the pricing structure on current 3090s and used equipment.

So, the primary concern is to avoid adding capacity unless it is absolutely necessary, IS managers said. What IS managers don't want to do is buy a system that will soon be technologically behind or that will suffer a big drop in value in the near future. If it is necessary to upgrade, then the goal of most IS managers is to buy as cheaply as possible — either on the used market or by working a deal with IBM.

"You make sure you have the best deal possible," said Bill Freel, an executive vice-president at Prudential Services Co., the information services arm of Prudential Life Insurance Co. "The better you can do, the less you're impacted by the new price/performance curve."

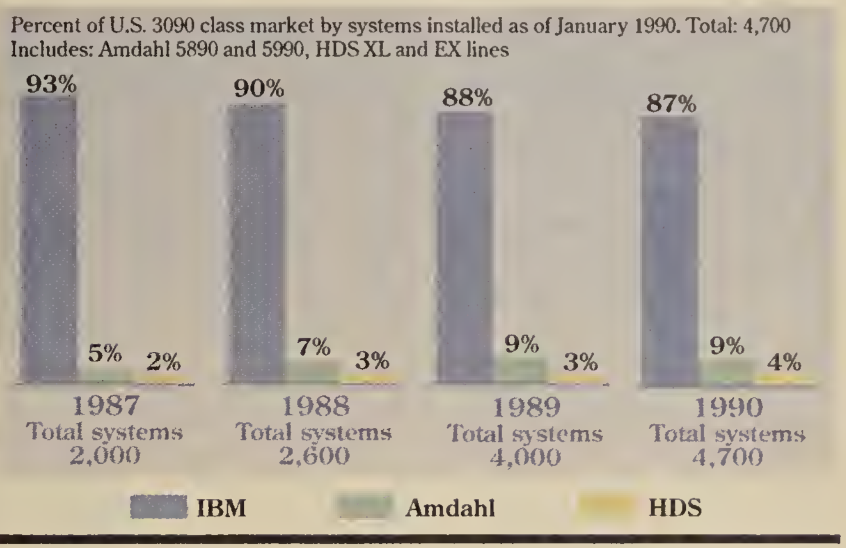
Analysts contacted recently report that while buying activity is typically slow at this time of year, it is taking even more of a dip because of preannouncement jitters.

"We are seeing a lot of hesitation and concern about up-

Continued on page 28

Big Blue marble

No matter how you cut it, the mainframe world remains IBM's domain



Percent of U.S. 3090 class market by systems installed as of January 1990. Total: 4,700
Includes: Amdahl 5890 and 5990, HDS XL and EX lines

Source: Computer Intelligence

CW Chart: Doreen Dahle

AS/400 utility debut makes few waves

BY MARYFRAN JOHNSON
CW STAFF

When IBM's new Application Program Driver (APD) appeared on the U.S. market a few weeks ago, it drew a few muffled cheers from small software vendors but mainly yawns of disinterest from the big software houses.

"This is one of those situations where the people who needed it already have it," said Jim French, director of technology at System Software Associates, Inc., a major Application System/400 software company in Chicago. "Those who don't have it haven't figured out they need it yet."

"It" is a precoded menu utility — a kind of operational housekeeper — that provides a standardized approach for key support functions common to nearly all applications. Those functions include menu design and control, security measures, single menu display, batch program scheduling, integration of transactions from various applications and save/restore functions.

"What IBM has done here is build in a lot of code for housekeeping features, things the little business partners can't afford to develop in their own applications," said Carson Soule, president of Computer Applications Specialists in Beltsville, Md. "The big application shops have been doing this stuff all along."

Old news in Europe

Available for years in Italy and other European countries, APD is a software shell that perches on the OS/400 operating system "and kind of tweaks it," said Tim Fenlon, president of Chiefs, a small software company in Franklin, Ohio, that specializes in public safety applications.

"We are using APD to assist us in controlling access and password security, so users can't poke around into other menus they are not authorized to see," Fenlon said. "It can also be used to automatically time-schedule backups, which is important to our customers, [who] are police, sheriffs and emergency medical departments."

"This may be one of the best products announced on the AS/400," added Fenlon, whose firm took part in IBM's prerelease program on APD. "With that relational database environment, you can get yourself in trouble if you don't know what you're doing or how the system is run. You can foul up your own applications without intending to."

More technically oriented users can employ the program driver to lash together a number of small applications from different companies, customizing their own menu screens with greater ease and navigating more smoothly between programs with a common interface.

IBM has set its one-time license charge for the utility from $900 to $2,400, but the going rate for menu utility packages from third-party vendors generally tops out at $900, several sources said.

The most likely customers for the program driver will be small software developers, customer sites with large AS/400 networks and their own programming staff and accounts with specific security concerns.

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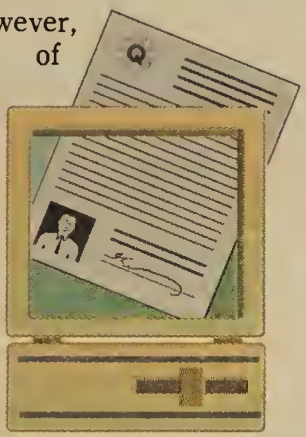
Loan staff saved by imaging lifeboat

Image processing rescues PNC from drowning in a paper flood

ON SITE

BY MARYFRAN JOHNSON
CW STAFF

PITTSBURGH — Summertime used to be crunch time for the student loan department at PNC Financial Corp., with thousands of documents rushing like a swollen river through John Koopman's division.



These days, however, the vice-president of PNC's Education Loan Center is basking in the glow of a successful imaging project that is harnessing that flood of paperwork and shoring up employee productivity.

The education loan center completed installation of a Filenet Corp. optical disc-based image processing system last year, with 15 dedicated Filenet workstations and an optical-disc storage "jukebox" that holds all of the student loan paperwork.

Letters, forms and applications that were once shuffled around manually in thousands of manila folders now reside electronically on-line. Access and retrieval of an estimated 2 million documents takes a few keystrokes rather than a safari to the file room.

"The change in our work environment and the impact on our business has been tremendous," Koopman said. "What the terminal and PCs did to the desk of the traditional office worker, imaging is doing for the clerk. It's radically changing their environment."

PNC is the 14th largest bank holding company in the U.S., with $40 billion in assets and 15 member banks in the Midwest and Northeast. All of the banks forward their student loan applications, notes and related paperwork to PNC for processing — a summertime rush that calls for processing 5,000 applications per week. This year, PNC expects to process 70,000 student loans.

The bank keeps the original note, but all other paperwork can be discarded once it is scanned into the system.

When the bank moved to a new building in March, Koopman was able to save $60,000 in annual rental fees for office space his 50-employee department no longer needed.

Converting the loan center's 150,000 paper files into imaged documents took 10 months, and employee training took an additional month. The resulting 20% improvement in employee productivity — through the elimination of several manual steps in the procedure — was another benefit, he noted.

Yet the most visible and important change, Koopman said, came in customer service.

"When someone calls in about a student loan, from the beginning you feel a little defensive," the banker said. "Everybody's perception is that this process is a pain in the neck, full of bureaucracy. This phone call is just heading down the dark tunnel!"

With document images readily available from each workstation, requests can often be handled while the client is still on the phone.

However, a more productive workplace may have side effects management did not anticipate, he added. Visual signs of progress used to be the shrinking stack of paperwork on the corner of the desk. "How do you give that operator a visual inkling of where they are in their process?" Koopman asked. "What worries me now is the long-term impact of this technology. Will a clerk end up feeling burned out after six months of sitting in a chair all day and looking at a terminal screen? That issue is probably the poorest addressed side of imaging."

Koopman *sees imaging impact*

His suggestion is for imaging vendors to follow the lead of Apple Computer, Inc.'s Macintosh personal computers and incorporate some colorful, graphical user interfaces into the imaging software to track and display a worker's progress.

As a predominantly IBM shop, PNC maintains all of its student loan accounting, payment history and financial records in a database on a 3090 mainframe, with a host connection to the Filenet system limited to workstation inquiries only.

"The inquiry function just pops up a 3270 window, and it's nice to be able to view on-line accounting data [from the mainframe] at the same time as the database on the Filenet system," said Nancy McDonald, who manages end-user technologies and custom services for the bank's data center. "But that's the only integration we need now."

When PNC went looking for an optical storage system in 1987, Filenet was the only vendor that inspired much confidence, Koopman recalled. "Nobody had all the pieces, really. But the software was where Filenet separated from everybody else."

The game has changed, Koopman and McDonald agreed, with imaging technology offered by IBM, Digital Equipment Corp., Wang Laboratories, Inc. and other vendors.

If the bank moves imaging technology into other divisions, it will probably lean toward imaging products from IBM rather than Filenet, McDonald noted. "While Filenet is certainly performing very well, they are dedicated workstations. You can't run Lotus or Wordperfect there," she explained. "The platform of the bank is heavily committed to IBM, and IBM has committed huge resources to research and development in imaging. Seeing is believing for a lot of it, of course, but you cannot ignore it."

Wang updates Office/Profs Gateway

BY SALLY CUSACK
CW STAFF

LOWELL, Mass. — Wang Laboratories, Inc. has expanded its support of IBM's Systems Application Architecture with a revised version of the Wang Office/Profs Gateway designed specifically to run in an IBM VM/XA SP2 environment.

Release 3.16.60 will continue to support IBM's VM SP5 and VM SP5 HPO operating systems, the company said. Wang Office/Profs Gateway was originally introduced to allow Wang Office users to exchange documents, memos, invitations and data processing files with Profs users. Available now, the latest release costs $4,000 for IBM systems. Wang Office/Profs Gateway for VS platforms ranges from $2,500 to $32,500.

The company also announced that it has certified VS Access/3210 Release 2.1 to run on IBM's ESA/370 operating system, allowing Systems Network Architecture (SNA) 3270 workstations and personal computers to log on to Wang VS systems via an SNA network. Release 2.1 was created to permit migration from MVS to ESA/370 without affecting current user access to a VS system.

VS Access/3270 costs $4,000 for MVS and ESA/370 and $2,500 for VM and VSE. Versions for the Wang VS series cost from $250 to $3,250.

A mainframe feel for Unix

BY ELLIS BOOKER
CW STAFF

ROSEMONT, Ill. — A move to Unix can be scary for dyed-in-the-wool IBM programmers. However, two recently introduced software tools reportedly make the transition a little easier, allowing users to cling to their familiar IBM mainframe program editors even after they have started sitting in front of Unix workstations.

In June, the Workstation Group, a division of Dynasoft Corp., introduced uni-Xedit and uni-Rexx, Unix versions of IBM's popular systems editor (Xedit) and its Systems Application Architecture procedures language (Rexx). The tools provide an IBM user interface but output Unix data structures.

Dynasoft developed the programs at the request of one of its big customers, Amoco Corp.

"Our interest started two years ago when we started to introduce Unix into our shop," said Ronnie Powell, a supervisor in the workstation support center at the Houston-based energy company.

Amoco first looked at Kedit, a personal computer version of Xedit from Mansfield Software Group, Inc. in Storrs, Conn. "We asked them about their development plans, and they said they were going to OS/2," Powell said. Similarly, Mansfield's Rexx product was destined for OS/2, not Unix, Powell was told.

So Amoco discussed the idea with Dynasoft, from which it had already purchased IBM mainframe utilities.

The result was a partnership of sorts: Amoco funded Dynasoft's initial research and development work and for this received a commitment of future support for the two products.

While Dynasoft's uni-Xedit and uni-Rexx mirror the command syntax of the IBM products, this does not extend to their underlying data structures. In other words, the Unix implementations of Rexx and Xedit output ASCII, not EBCDIC, as do IBM systems. Although not naturally compatible, there are ways to reformat and exchange data files between the systems.

Powell said that the savings from the tools, which have been used by Amoco's Unix programmers for about a year, are somewhat intangible. "We wanted to reduce the barrier to getting into this environment," he said. "We didn't figure, 'This will save 20 hours of training.' "

Critics could reasonably question the wisdom of replicating IBM mainframe commands on modern Unix workstations, Powell admitted. But the goal of the project was "to lower the discomfort level," he said, and the project was undertaken with the expectation that the VM programming staff, after growing accustomed to Unix, might find Unix tools preferable to the mimicked IBM ones.

Prices start at $399 for each tool or $699 for both.

Global interface released

BY MAURA J. HARRINGTON
CW STAFF

RALEIGH, N.C. — Global Software, Inc. has introduced Manager's Workstation, a graphical interface designed to enhance personal computer access to IBM Application System/400 computers and IBM mainframes.

Although it is designed primarily for Global's Executive Information System, Manager's Workstation can also be used with other Global software, the company said.

The product features a four-color, menu-driven format, as well as graphics and mouse capabilities. Additional features include the ability to create spreadsheets and comparison charts and to access Global and non-Global products, said Thomas Roberg, Global vice-president. "The whole point of this product is to give the user an easy way to talk to the system."

Julie Skibski, senior systems analyst and programmer at Toledo Hospital in Toledo, Ohio, said that while the computing capabilities and interface to non-Global products sound attractive, the product is a luxury at the present price.

"We have Global's general ledger and accounting packages, and it would be nice to be able to link our products to non-Global products. But we're also looking at costs, and we couldn't justify it," Skibski said.

The price for Manager's Workstation ranges from $5,000 to $10,000 and must be used with at least one other Global application product.

Available now, Manager's Workstation must be used with an MS-DOS or OS/2 operating system, a 1M-byte Intel Corp. 80286-based PC with a 20M-byte hard drive, Enhanced Graphics Adapter or Video Graphics Array color monitor and a mouse, touch screen or host-access board.

PRODUCT REVIEW

Ideal's case for decision support

Computer Associates International, Inc.

This is the third in a monthly series of performance benchmarks that for the next several months will focus on the integration of computer-aided software engineering (CASE) and fourth-generation language (4GL) products. The benchmarks are monitored by an independent team headed by David Whiteside, managing director of Computing Futures Ltd. and his associate, Prof. Eberhard Rudolph, formerly of the University of Auckland, for exclusive publication in Computerworld.

Each product is observed in action over a three-day period during which a vendor team solves the case study project costing system, an application familiar to most information systems professionals. The team's mission is to demonstrate the capability of the major CASE/4GL environments to deliver complete and complex business solutions under "live fire" conditions. In this issue, we look at the development tools CA-Ideal and CA-Datacom from Computer Associates International, Inc.

•

Carried out by CA in the UK, the solution to the benchmark problem was basically complete, but it lacked in some minor areas. However, the CA solutions complied almost totally with IBM's Common User Access entry-level requirements. Thus, we rated the level of completion "very good."

•

CA's test team consisted of three specialists as well as a project leader, who spent almost all of his time identifying possible enhancements. CA put an unusually strong effort into finding a solution to the benchmark problem that would incorporate any change it could anticipate. As a result, the overall effort of 162 hours, including 104 hours of planning, was much higher than what we have observed in previous tests. It also exceeded the 120-hour time frame suggested by several estimating tools.

The development speed was further hindered by the high volume of coding detail required and several failures of the software environment. For these reasons, we rated the speed of development "poor."

•

However, the prodigious effort put into initial development paid off in maintenance. Most of the enhancements we asked for at random were already in place. Only minor modifications were needed, preventing a demonstration of the true maintenance capabilities. Under the circumstances, we rated speed of maintenance "excellent."

•

While the documentation produced was complete, it was not particularly readable. It consisted of program listings, data definitions and layout definitions, identification and resources. No graphical representation was generated. Thus, we graded documentation "fair."

•

There were no tools to be integrated. Third-party CASE tools could be used up front, but their results have to be imported manually into the CA environment. Therefore, a "not applicable" rating was given to the integration of tools category.

•

The end-user tool CA-Dataquery was impressive. It was very easy to use and handled the inquiry jobs without fail. The personal computer version of this tool was also used successfully to import Ashton-Tate Corp. Dbase files in the interface section. It fully deserved the rating "excellent."

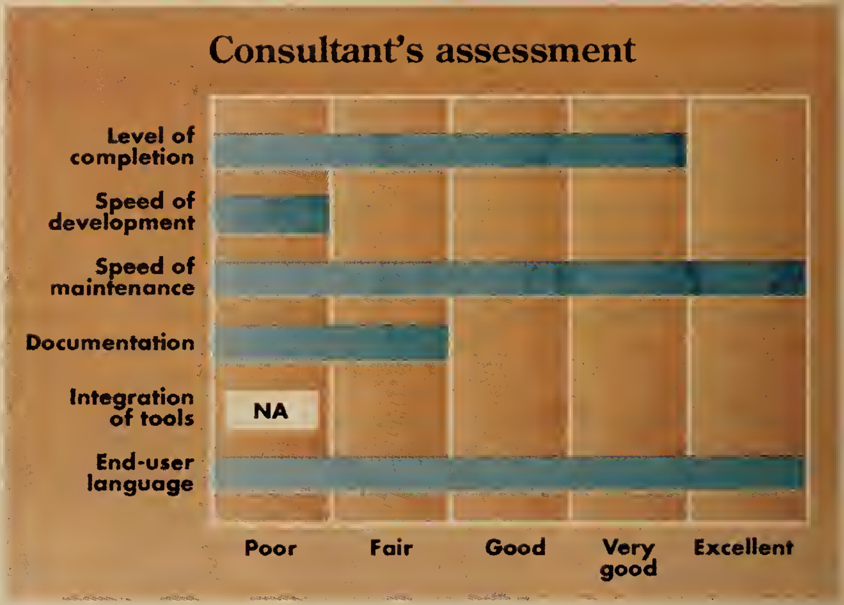
•

In summary, the considerable effort CA put into solving the benchmark problem did not always pay off. However, a workable solution was provided for a mainframe environment. In our case, it was easily maintained and provided guided access for the end user with decision support needs.

Computer Associates tool kit

- CA-Datacom — DBMS including SQL relational support
- CA-Ideal — Fourth-generation language
- CA-Dataquery — End-user decision support tool
- CA-Dataquery PC — PC version of the decision support tool

Consultant's assessment



Development and maintenance report card

Performance in each area is graded from A (excellent) to F (poor).

ANALYSIS AND DESIGN: NA
In the absence of an integrated CASE tool, the CA solution was analyzed and designed with a great deal of effort during the planning stage. It took a team of three 13 man-days prior to the start of the benchmark.
Strength: Not applicable.
Weakness: There is no bridge to third-party CASE tools.

DATABASE SETUP: D
This stage took a very long time to set up. A lack of familiarity with SQL coupled with meaningless error messages and a bug in an SQL function were the roots of the delays. An overly complex solution further added to the problem.
Strength: Full SQL support.
Weakness: It is not very helpful to the developer.

FILE MAINTENANCE TRANSACTIONS: D
Again, this was a very cumbersome process in which the programmer had to define the program code at a detailed level. The only help was Ideal and SQL syntax templates, which could be adapted with the source code editor.
Strength: All program components make use of the data dictionary.
Weakness: The programmer is overburdened by detail.

COMPLEX TRANSACTIONS: C
Where much attention usually has to be given to coding details, Ideal was able to tackle the job without much difficulty.
Strength: Use of data integrity provided by the schema.
Weakness: There is still a lot of detail to cope with.

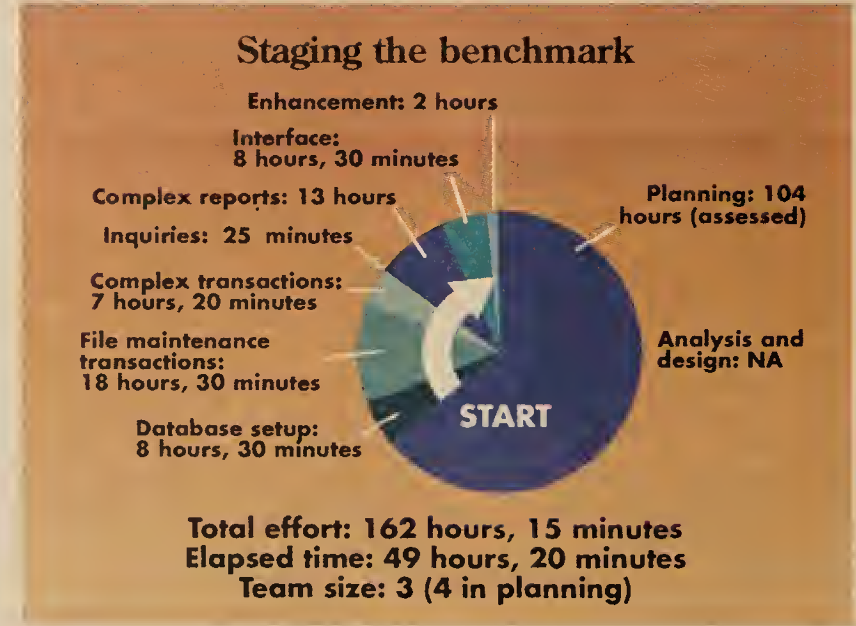
INQUIRIES: A
What a contrast. The end-user tool Dataquery provided the answers with ease. A "guided tour" even directed the casual user to a solution, which is integrated with the data architecture of the whole system.
Strength: It provides SQL power to the end user.
Weakness: None identified.

COMPLEX REPORTS: D
Because the complex report had to be coded in Ideal, it took an excessive amount of time and was barely completed by the end of the benchmark.
Strength: The data dictionary assists in the reporting process.
Weakness: It lacks an efficient report-painting facility.

INTERFACE: B
CA-Dataquery PC was used to load the data into the mainframe environment. A modified version of the Ideal timesheet program provided a solution after a data definition error was spotted.
Strength: Dbase III files are uploaded with ease.
Weakness: The error report has shortcomings.

ENHANCEMENT: A
This was an easy cruise because all the data changes were already anticipated and incorporated from the beginning. The necessary layout and logic changes were made without difficulty.
Strength: A well-planned data structure.
Weakness: The system is overly complex.

Staging the benchmark



Total effort: 162 hours, 15 minutes
Elapsed time: 49 hours, 20 minutes
Team size: 3 (4 in planning)

The solution was developed on an IBM 3081 mainframe under MVS/XA Version 2.2.3 and JES 2, which provided central support services for Northern Europe and provided U.S. gateways supporting between 200 and 300 terminals.

Details of the products are available from Computer Associates World Headquarters, 711 Stewart Ave., Garden City, N.Y. 11530, (516) 227-3300.

Development World *product briefings are based on a series of full solutions to the case study. They are prepared by leading vendors and published along with in-depth product analyses and consultants' test reports in Development World Libraries. Please see business reply card between pages 60 and 61 or fax (508) 820-0146 for a brochure.*

A Comparison Chart of the Major Cooperative Processing Software Products:

FUNCTIONS:	SUPER-LINK®	Easel™	Mozart™	Arbiter®	IBM's HLLAPI™	IBM'S APPC™
Processing Topologies Supported						
Peer-to-Peer Processing	✓			✓		✓
Existing terminal-based systems	✓	✓	✓		✓	
Mixed Peer-to-Peer and existing systems	✓					
Application integrity/Software Distribution	✓		some			
SAA/CUA Interface compatibility	✓	✓	some			
Workstation Environments Supported						
PC/DOS	✓	✓	✓	✓	✓	✓
OS/2	✓	✓	✓	✓	✓	✓
PC/DOS to OS/2 application compatibility	✓		?			
LAN Server for shared applications and data	✓		?			
Multiple transaction servers on a LAN	✓					
Development Environment Comparison						
Object orientation	✓	some				
Dictionary and documentation	✓					
Panel/Form painter for creation/maintenance	✓	✓	some			
3270 screen capture: picture and attributes	✓					
CASE/Application Generation	✓	✓				
Intelligent (language-sensitive) editor	✓					
System and user-defined reusable code templates	✓					
Integrated compile/test/debug	✓	✓				
Execution time source debugging	✓	some				
All development tools for DOS available in DOS	✓		✓			
Objects Supported						
CUA display images	✓	✓				
CUA dialog within display object	✓					
Validation within display object	✓					
Help processing	✓					
Error processing	✓					
Text window interactions	✓	some				
Business graphics	✓	✓				
3270 definition	✓					
Interactions with 3270	✓					
Interactions with Peer-to-Peer	✓					
"Logon" Scripts	✓					
Application integrity/Software Distribution	✓					
Local Data Access						
Indexed files	✓		✓			
dBase	✓		✓			
Flat Files (random access)	✓					
Flat Files (sequential access)	✓	✓	✓			
Multiple read/write to files on LAN Servers	✓					
High Level Functions Directly Available in the Language						
Field-level context sensitive help	✓		✓			
Optional user learning mode	✓					
Display and selection from:						
Indexed files	✓		✓			
Sequential files	✓	✓	✓			
In-memory lists	✓	✓	✓			
Menu display and selection	✓		✓			
Determining 3270 screen identification	✓		✓			
Read/write to 3270 in a single command	✓					
Read/write to 3270 one field at a time	✓	✓	✓			
Determine dynamic 3270 attribute changes	✓					
Embedded user assistance (pop-up selection lists)	✓					
Data editing/validation:						
Data type/mark checking	✓		✓			
Single range/limit check	✓		✓			
Field/data driven range/limit check	✓					
Date formatting/validation	✓		✓			
Validation against local and LAN files	✓					
Required fields	✓		✓			
"Must Fill" fields	✓					
Zero not valid fields	✓		✓			
Peer to Peer Host Environments Supported						
MVS-CICS	✓			✓		✓
MVS-IDMS/DC	✓					
MVS/TSO	✓					
DOS/VSE-CICS	✓			✓		
VM/CMS	✓			✓		✓
DEC VAX/VMS	✓					
Software Distribution Host Environments Supported						
MVS-CICS	✓		✓			
MVS-IDMS/DC	✓					
MVS/TSO	✓					
DOS/VSE-CICS	✓					
VM/CMS	✓					
DEC VAX/VMS	✓					

Every effort to present an accurate chart has been made, however no guarantee can be made (1/2/90). Super-Link® is a registered trademark of Multi Soft, Inc., Lawrenceville, NJ. Mozart™ is a trademark of Aspen Research. Easel™ is a trademark of Interactive Images, Inc. Arbiter® is a registered trademark of Tangram Systems.

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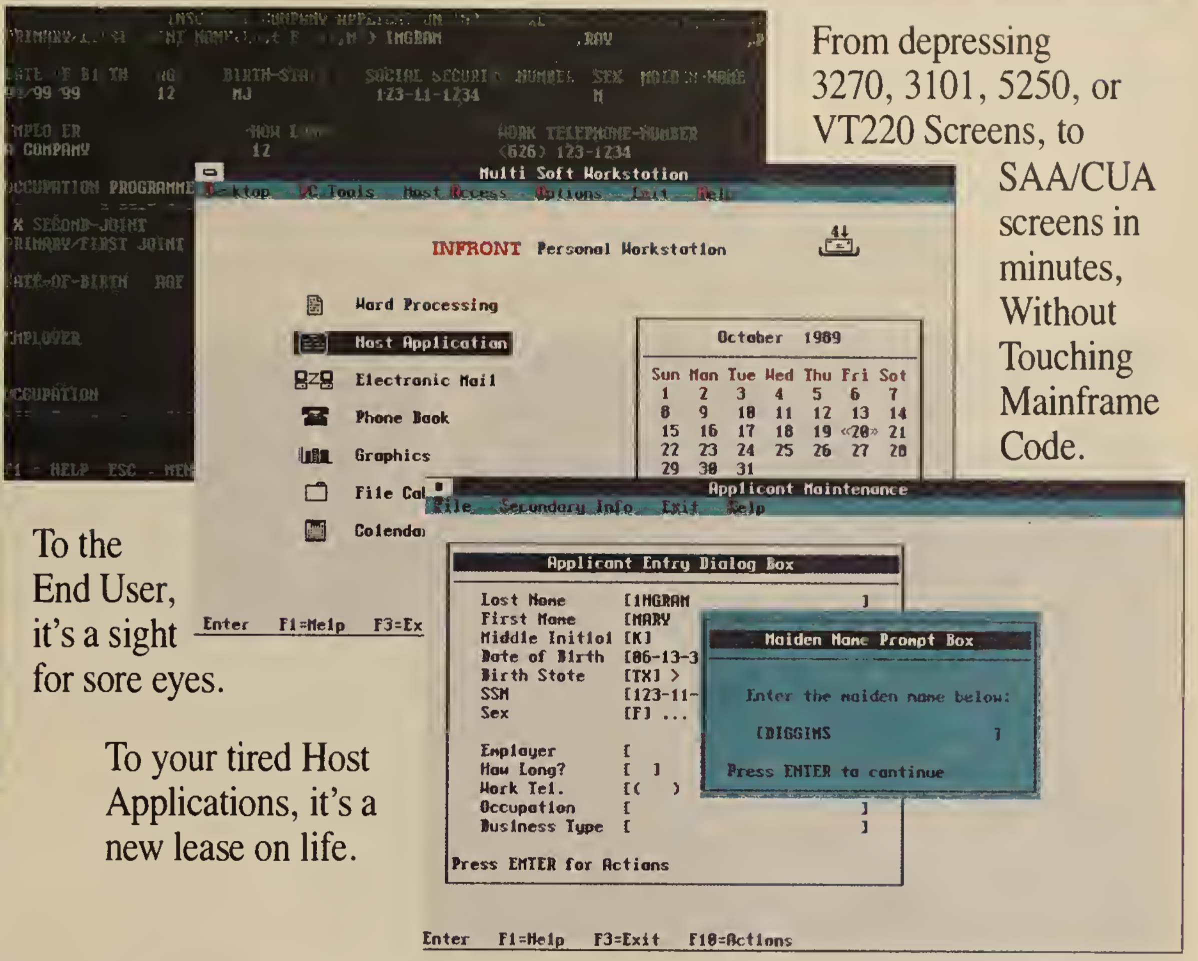

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BIRTH-STA    SOCIAL SECURI  NUMBER  SEX
12        NJ           123-11-1234          M
                                        WORK TELEPHONE-NUMBER
COMPANY       12                        (626) 123-1234
X SECOND-JOINT
PRIMARY/FIRST JOINT
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October   1989
Sun Mon Tue Wed Thu Fri Sat
 1   2   3   4   5   6   7
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22  23  24  25  26  27  28
29  30  31
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Applicant Entry Dialog Box

Last Name        [INGRAM                 ]
First Name       [MARY
Middle Initial   [K]
Date of Birth    [06-13-3
Birth State      [TX] >
SSN              [123-11-
Sex              [F] ...

Employer         [
How Long?        [  ]
Work Tel.        [(    )
Occupation       [                       ]
Business Type    [                       ]

Press ENTER for Actions

Maiden Name Prompt Box

Enter the maiden name below:

[DIGGINS                  ]

Press ENTER to continue

Enter   F1=Help   F3=Exit   F10=Actions
```

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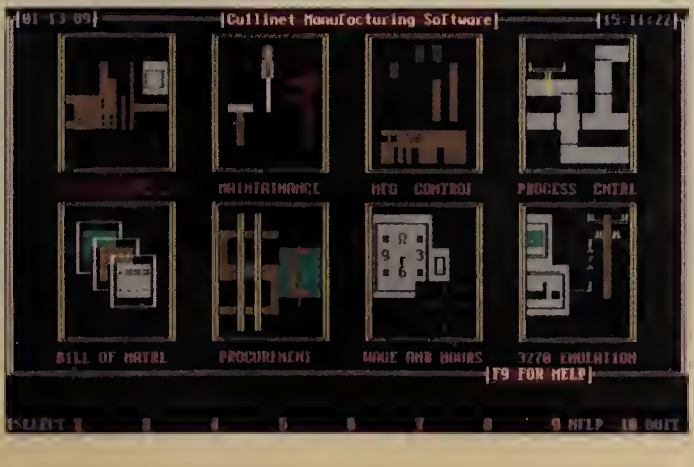

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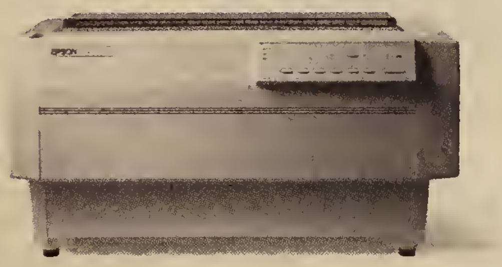

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Glass

FROM PAGE 25

neither proven to exist nor analyzed as to its causes. Why, then, do we have this mentality?

Usually the software crisis is cited as a justification for a research study. Give us funding, the researchers say, and we will automate some technical portion of the software development process, which will in turn solve the crisis. Since we understand far too litle about this problem, it is unclear that the solution will be technical.

Let us suppose that there is some validity to the crisis and that many projects are behind schedule and over budget. Can we hypothesize a cause? The simplest explanation I can think of suggests a single source for all three symptoms. We simply do a bad job of estimating how long it will take to build software.

It is obvious that this problem could cause poor schedule and budget performance. But what about unreliability? I would assert that troubled software projects, finding themselves badly behind schedule, skimp on the activity under way when the deadline draws near. What is that activity? Testing. We skimp on testing and release unreliable software, because it's our last hope of catching up.

If I am right, the software crisis is not about how we actually construct software but about how we *think* we construct it. That is, it is not the technology of software construction that is the problem — it is the management of that technology. If it is a management problem, it is unlikely that it will be solved by technical solutions. Putting this another way, all those who are crying "software crisis" to obtain research funds are simply crying wolf.

If we assume that the software crisis is indeed a management problem, what can we do about it? The obvious answer is to find better ways to estimate costs and schedules. At first glance, that throws us back into a technology problem. Can't we find better algorithms for doing estimation?

We have had lots of algorithmic answers to that question for over a decade now. Although some are better than others, and although we are better off using them than not, they have not proven to be either consistent or accurate.

If estimation algorithms are not the answer, what is? My somewhat outrageous answer is what I call "guts management." We need managers who stand up under pressure.

Look at the environment in which we software people do our estimates. Someone conceives of an idea. If the idea looks good, everyone wants the product yesterday. In some cases it is marketing, pushing to have it ready by some window of opportunity. In other cases, it is systems engineering, pushing to have it available when its interfacing technology is ready. The pressures in this kind of environment are enormous.

What do we in software do about that? We make three serious errors:

- We give in to the desired schedule dates rather than holding firm for our own best estimates. In other words, we frequently find ourselves managing according to a schedule we never did believe in.
- We give estimates at the start of the project and then manage to them. We rarely update the estimates to match real activity.
- Worst of all, we live or die by estimates given before the requirements were even defined and, therefore, before we fully understood the problem!

A guts manager is one who stands by his or her guns at the outset, insisting on appropriate approaches to project scheduling, suffering pain at the beginning of a project instead of postponing it until the end.

That is easy to say and less easy to do. But the route to progress is often charted by the amount of pain in the status quo, and there is enormous pain because of the present "software crisis" mentality.

Glass is president of Computing Trends, a software engineering consulting and publishing company based in State College, Pa.

Mainframe

FROM PAGE 25

grades," said Frank Gens, a vice-president at Technology Investment Strategies Corp. in Framingham, Mass. "We are working with accounts who are evaluating capacity requirements, and the prevailing sentiment is we've got to cover our rears as well."

Jim Matsey, IS director at Reynolds Metals Co., said he needs additional capacity by year's end but won't make any decisions until he sees the new mainframes. "I'm in a wait state until the announcement," Matsey said. "I can't take action until I see it. I wouldn't buy any kind of machine right now."

Jim Cassell, a vice-president at Gartner Group, Inc., said customers should be working deals with IBM for the new systems that also include a good price on whatever additional capacity they may need between now and when those systems are available. He targets availability of the new generation for late 1991.

"It's our view that users should make a transition bid," Cassell said. "They should be thinking, 'I really want to position myself for the new technology in late 1991, but I need something in the meantime.' So, they should ask IBM, 'How do I get from here to there at the least cost?' This should be a capacity bid, not a box bid."

Some IS shops seem to have more difficulty working with the big question mark than others. The Boston Industrial Products division of Dana Corp. is running out of horsepower with its 4381 and has its fingers crossed that IBM will deliver the long-awaited follow-on, the so-called 4391, this fall, said Rich Krejsa, manager of systems programming. The 4391 is reportedly part of the big mainframe announcement IBM has scheduled for next month.

If IBM doesn't deliver, "we will seriously have to rethink our mainframe strategy," Krejsa said. "We've been holding up some projects that we know will increase our utilization. I think we can get by until the end of the year."

However, Prudential Services, which has several 3090-class machines, seems to be taking this more in stride. Freel said that even if the company bought another mainframe now that was outdated — either technologically or financially — by the announcement, it could always reshuffle its systems and assign it to a less critical aspect of the business.

"We have enough equipment in place, so we can play the rollover game," Freel said. "If we acquire one today that's impacted [by the announcement], that's not our only one. That could operate for another five or six years at various places in the organization."

NEW PRODUCTS — SOFTWARE

System software

Exide Electronics Corp. has introduced Onlinet, an interface software package that enables users to continuously monitor power quality and uninterruptible power supply status from a workstation.

When a power failure is detected, the software broadcasts a warning message and initiates an automatic, user-defined shutdown procedure for attended or unattended operations, the vendor said.

The software is compatible with The Santa Cruz Operation's Xenix operating system and runs on all models of the Powerware Personal series. The list price is $149.

Exide Electronics
3201 Spring Forest Road
Raleigh, N.C. 27604
(919) 872-3020

Utilities

Mackinney Systems has announced a global cross-reference generator that reads Cobol source code.

Cobol Glossary Release 3.8 enables users to read source code from VSE libraries, CA-Librarian, ICCF or or IEBPTPCH files from a partition data set. Features include a report that lists illegal verbs used in CICS command-level programs and the ability to assist users in Cobol II conversions.

The product costs $695 or $295 for an annual lease. A 30-day trial period is also offered.

Mackinney Systems
2740 S. Glenstone
Springfield, Mo. 65804
(417) 882-8012

Information Dimensions, Inc. has announced an image processing module for Digital Equipment Corp. VAX/VMS-based X Window applications of its Basisplus text information management system.

Basisplus/DMXRV combines the content-based text retrieval capabilities of Basisplus with single-screen image and graphics viewing. The product runs on VAX/VMS systems and on all other major hardware platforms.

A first copy license ranges from $5,000 to $179,000 for Basisplus and $500 to $7,500 for Basisplus/DMXRV.

Information Dimensions
655 Metro Place South
Dublin, Ohio 43017
(614) 761-8083

NEW PRODUCTS — HARDWARE

Processors

NCR Corp. has announced an enhanced version of its 2127 Retail System, a point-of-sale and transaction processing system designed for food, drug and general retail companies.

Features of the system include high-density disk drives that double storage capacity from 20M to 40M bytes, a 25% increase in processing speed and automated transaction and management reporting functions.

The system costs between $4,500 and $8,500, depending on configuration.

NCR
1334 S. Patterson Blvd.
Dayton, Ohio 45479
(800) 225-5627

Sky Computers, Inc. has introduced an array processor that combines the Intel Corp. I860 and I960 reduced instruction set computing processors in a single board-level array processor.

Sky Warrior II features a processing speed of more than 80 million floating-point operations per second. I/O, memory and diagnostic functions are handled by the I960 microprocessor, enabling the I860 to be used for other computing tasks.

The product supports several operating systems, including AT&T's Unix System V and Sun Microsystems, Inc.'s Sun OS. It is priced at $8,225.

Sky Computers
27 Industrial Ave.
Chelmsford, Mass. 01824
(508) 250-1920

The RF-10J *holds 10G bytes of data*

Data storage

Reflection Systems, Inc. has introduced a 10G-byte optical-disc jukebox that can hold up to 11 Plasmon 940M-byte 5¼-in. write-once optical discs.

The RF-10J jukebox includes a small computer systems interface that enables it to be incorporated into multiuser operating systems or stand-alone personal computers. It features a drive with an average seek time of more than 100 msec and a maximum sustained data transfer rate of 655K bit/sec., the vendor said.

The product is priced at $12,500.

Reflection Systems
P.O. Box 611508
San Jose, Calif. 95161
(408) 432-0943

American International Devices, Inc. has announced the AI/4104DD, an 8M-byte add-in memory board designed for IBM Application System/400 Models B-10 and 20 as well as C-10, 20 and 25.

The board is completely plug-compatible with AS/400 hosts and with any combination of IBM-resident memory. Two AI/4104DD boards can be equipped with two American International or IBM 4M-byte daughterboards to provide the AS/400 Model C-20 with 32M-byte capacity, the vendor said.

The board's price is $8,000.

American International
12540 Beatrice St.
Marina Del Rey, Calif.
90066
(800) 243-4433

How to answer the needs of 386 users with just one line.

It's the COMPAQ line of high-performance 386 desktop personal computers. We designed each one with just the right balance of quality COMPAQ features and Intel 386 power. Giving you the perfect choice for every user, at every level.

Just turn the page for proof. We put extensive information about the entire line on a handy, removable reference chart. From the COMPAQ DESKPRO 386/33L to the COMPAQ DESKPRO 386N you'll find six levels of 386 performance designed to meet the wide range of your desktop computing needs. Each personal computer is built to be compatible with the industry-standard hardware and software you've invested in.

But why did Compaq create such a broad 386 desktop line? Because you told us to.

At Compaq, our first rule is to build computers that literally answer our users' very latest needs. So we regularly seek out a variety of PC users like you. We ask questions, probe for input—even criticism.

We then combine all these ideas with our own innovative thinking and the best of the latest PC technology, to create products that deliver not just high performance, but the *right* combination of features for you.

That's how we started this line, when we introduced the industry's first 386-based PC. That's how we consistently break through to new levels of PC performance. And most importantly, that's how we earned our sterling worldwide reputation for delivering the ultimate in power, compatibility and reliability. At every level.

Turn the page and see for yourself. Not only will you see the one 386 line that simply works better. You'll see which PCs in that line simply work better *for you.*

One line that simply works

Key Features and Options	COMPAQ DESKPRO 386N	COMPAQ DESKPRO 386S
Product Class	Low-profile desktop	Small desktop
The User	For the user who needs 386SX performance and requires specific network features	For the general business user considering 286 personal computers
Microprocessor	32-/16-bit 386SX	32-/16-bit 386SX
Clock Speed	16-MHz	16-MHz
Coprocessors Supported	16-MHz 387SX	16-MHz 387SX
Expansion Slots Available	3	5
Type	(2) 8-/16-bit ISA (1) high-speed memory	(4) 8-/16-bit ISA (1) high-speed memory
Standard Memory	1 MB	2 MB
Maximum Memory	16 MB	13 MB
Storage Capabilities		
3½-inch Diskette Drive	1.44-MB standard	1.44-MB standard, second optional
5¼-inch Diskette Drives	1.2-MB optional	1.2-MB optional 360-Kbyte optional
Standard Fixed Disk Drives	40-MB	84-MB 40-MB
Optional Fixed Disk Drives *Fixed Disk Expansion Unit only. **Supported in Model 1 only.	120-MB 60-MB 40-MB 20-MB	Fixed Disk Expansion Unit (Model 300) 320-MB** 84-MB 300-MB* 40-MB 110-MB 20-MB
Maximum Storage Capacity	120 MB	1.2 GB
Tape Drives (Optional)	N/A	150-/250-MB, 80-/120-MB, or 60-MB
Operating Systems MS-DOS and MS OS/2 are available from Compaq	MS-DOS, MS OS/2, Novell NetWare, Microsoft LAN Manager, Banyan VINES, SCO UNIX/386	MS-DOS, MS OS/2, Novell NetWare, Microsoft LAN Manager, Banyan VINES, SCO UNIX/386
Display (Optional)	Video Graphics Color Video Graphics Monochrome	Advanced Graphics Color Video Graphics Color Video Graphics Monochrome
Video Controllers	Video Graphics (standard) 640 × 480 graphics 720 × 400 text 132-column text support	Video Graphics (standard) 640 × 480 graphics 720 × 400 text Advanced Graphics 1024 (optional) 1024 × 768 graphics 720 × 400 text
Keyboard	Enhanced Keyboard	Enhanced Keyboard
Dimensions	15.0″W × 14.9″D × 3.9″H (38.1cmW × 37.8cmD × 9.9cmH)	15.8″W × 14.8″D × 5.9″H (40.1cmW × 37.5cmD × 14.9cmH)
Additional Options ‡U.S. and Canada.	2400-Baud Internal Modem‡	2400-Baud Internal Modem‡

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better for all 386 users.

COMPAQ DESKPRO 386s/20	COMPAQ DESKPRO 386/20e	COMPAQ DESKPRO 386/25e	COMPAQ DESKPRO 386/33L
Small desktop	Small desktop	Small desktop	Fully expandable desktop
For the general business user who requires more performance and features in a mainstream 386SX personal computer	For the advanced productivity user who needs the right combination of performance and features	For the experienced user who needs superior capabilities and power	For the performance-sensitive user requiring the ultimate in 386 performance and expandability
32-/16-bit 386SX 20-MHz with 4K Cache	32-bit 386 20-MHz with 32K Cache	32-bit 386 25-MHz with 32K Cache	32-bit 386 33-MHz with 64K Cache
20-MHz 387SX	20-MHz 387 or Weitek 3167	25-MHz 387 or Weitek 3167	33-MHz 387 and 33-MHz Weitek 3167
4 (4) 8-/16-bit ISA	5 (4) 8-/16-bit ISA (1) 32-bit memory	5 (4) 8-/16-bit ISA (1) 32-bit memory	7-8 (7) 8-/16-/32-bit EISA (1) 32-bit memory
2 MB 16 MB	4 MB 16 MB	4 MB 16 MB	4 MB 100 MB
1.44-MB standard, second optional	1.44-MB standard, second optional	1.44-MB standard, second optional	1.44-MB standard, second optional
1.2-MB optional 360-Kbyte optional	1.2-MB optional 360-Kbyte optional	1.2-MB optional 360-Kbyte optional	1.2-MB optional 360-Kbyte optional
120-MB 60-MB	110-MB 40-MB	120-MB 60-MB	650-MB 320-MB 120-MB
Fixed Disk Expansion Unit (Model 650 & 300) 650-MB* 120-MB 300-MB* 60-MB 210-MB 40-MB	Fixed Disk Expansion Unit (Model 300) 320-MB** 84-MB 300-MB* 40-MB 110-MB 20-MB	Fixed Disk Expansion Unit (Model 300) 320-MB** 84-MB 300-MB* 60-MB 120-MB 40-MB 110-MB	Fixed Disk Expansion Unit (Model 650 & 300) 650-MB 210-MB 320-MB 120-MB 300-MB* 420-MB Drive Array Pair 240-MB Drive Array Pair
2.6 GB	1.2 GB	1.2 GB	2.6 GB
150-/250-MB, 80-/120-MB or 60-MB	150-/250-MB, 80-/120-MB or 60-MB	150-/250-MB, 80-/120-MB or 60-MB	320-/525-MB, 150-/250-MB or 80-/120-MB
MS-DOS, MS OS/2, Novell NetWare, Microsoft LAN Manager, Banyan VINES, SCO UNIX/386	MS-DOS, MS OS/2, Novell NetWare, Microsoft LAN Manager, Banyan VINES, SCO UNIX/386	MS-DOS, MS OS/2, Novell NetWare, Microsoft LAN Manager, Banyan VINES, SCO UNIX/386	MS-DOS, MS OS/2, Novell NetWare, Microsoft LAN Manager, Banyan VINES, SCO UNIX/386
Advanced Graphics Color Video Graphics Color Video Graphics Monochrome	Advanced Graphics Color Video Graphics Color Video Graphics Monochrome	Advanced Graphics Color Video Graphics Color Video Graphics Monochrome	Advanced Graphics Color Video Graphics Color Video Graphics Monochrome
Video Graphics (standard) 640 × 480 graphics 720 × 400 text 132-column text support Advanced Graphics 1024 (optional) 1024 × 768 graphics 720 × 400 text	Video Graphics (standard) 640 × 480 graphics 720 × 400 text Advanced Graphics 1024 (optional) 1024 × 768 graphics 720 × 400 text	Video Graphics (standard) 640 × 480 graphics 720 × 400 text Advanced Graphics 1024 (optional) 1024 × 768 graphics 720 × 400 text	Video Graphics (standard) 640 × 480 graphics 720 × 400 text 132-column text support Advanced Graphics 1024 (optional) 1024 × 768 graphics 720 × 400 text
Enhanced Keyboard	Enhanced Keyboard	Enhanced Keyboard	Enhanced Keyboard
15.8″W × 14.8″D × 5.9″H (40.1cmW × 37.5cmD × 14.9cmH)	15.8″W × 14.8″D × 5.9″H (40.1cmW × 37.5cmD × 14.9cmH)	15.8″W × 14.8″D × 5.9″H (40.1cmW × 37.5cmD × 14.9cmH)	19.2″W × 17.7″D × 6.5″H (48.8cmW × 45.0cmD × 16.6cmH)
2400-Baud Internal Modem‡	2400-Baud Internal Modem‡	2400-Baud Internal Modem‡	2400-Baud Internal Modem‡

Printed in the U.S.A.

The right desktop for every desk top.

What kind of system do you need? A sophisticated technical workstation? A powerful server supporting multiple nodes? General business PCs? A combination of all three?

Take your pick. COMPAQ 386 PCs have you covered, whatever your needs. Because we developed the line to meet different users' power and expandability requirements.

Choose our fully expandable desktops for specialized power users. They support features like Intel and Weitek coprocessors, lightning-fast fixed disk drive arrays and storage expandability up to an incredible 2.6 gigabytes. And the COMPAQ DESKPRO 386/33L can even be upgraded to 486 power.

Our small desktops offer multiple levels of power to cover a broad range of users' needs. And our new low-profile desktop provides basic 386 power for stand-alone or networked environments.

USER TYPES	TYPICAL APPLICATIONS	PERFORMANCE/EXPANSION REQUIREMENTS	PRODUCT
Specialized/Power	CAD/CAE Scientific Analysis Software Development Customized LAN File Server	Higher 386 Performance Maximum Desktop Expansion	COMPAQ DESKPRO 386/33L
Advanced Productivity	Financial Analysis Database Presentation Graphics Small LAN File Server	DX (32-bit) Performance Moderate Expansion	COMPAQ DESKPRO 386/25e COMPAQ DESKPRO 386/20e
Mainstream Productivity	Word Processing Spreadsheets Database Stand-alone or Networked PCs	Moderate Performance Specific Network Features Minimum Expansion	COMPAQ DESKPRO 386s/20 COMPAQ DESKPRO 386s COMPAQ DESKPRO 386N

Now, for the real thing.

You've seen our line of 386 desktops on paper. You've seen how the right combination of power and features, along with compatibility and reliability, makes it the best platform for your high-performance solution. Now, you're ready to see it in person.

Which is something you can do right in your area through our worldwide network of Authorized COMPAQ Computer Dealers. Our dealers are trained to be experts at combining COMPAQ platforms with products from the leading software and hardware companies. To build the best overall COMPAQ-based solution to meet your specific needs.

Call now to find the dealer nearest you. In the U.S., 1-800-231-0900, Operator 135. In Canada, 1-800-263-5868, Operator 135.

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It simply works better.

COMMENTARY

Patricia Keefe

A house divided?

Boomin' Steve Ballmer, Microsoft's senior vice-president of software, roared through these offices two weeks ago (by the time this hits your mailbox), banging the gong on a host of Microsoft product directions and strategies.

The ever-effervescent Ballmer was surprisingly blunt when it came to the one topic of discussion that Microsoft officials would no doubt like to avoid — its bruised partnership with IBM.

(Remember, Ballmer is the man who penned the epitaph for Intel's 80286 chip long before the infamous red-X campaign was launched. Pressured to explain why protected-mode 286 DOS had not been delivered, he blurted out in late 1987 that the 286 "was brain-dead." The 286 has taken a backseat among developers ever since. We had to wait for Windows 3.0 to get protected-mode capabilities with DOS.)

Zooming back to the present, the fact that IBM and Microsoft have their differences is hardly news. The trade press has been chasing this story for years — literally.

What *is* new are admissions such as the ones Ballmer recent-

Continued on page 42

Microsoft ships 2.0 update kit

Tools for third-party development of 32-bit applications included

BY PATRICIA KEEFE
CW STAFF

REDMOND, Wash. — Microsoft Corp. is now shipping an OS/2 2.0 Software Development Kit (SDK) Update for the OS/2 Presentation Manager system Version 2.0.

The update includes the necessary prerelease components for corporate and third-party developers to write 32-bit applications prior to the general release of OS/2 Version 2.0. The OS/2 2.0 SDK includes a 32-bit version of Microsoft's Macro Assembler Version 5.1, 32-bit application programming interfaces, a 32-bit compiler based on Microsoft C Version 5.1, a new linker and other Presentation Manager-related tools.

A network redirector permits access to a network while writing code. Documentation is provided in more than 2,000 pages of hard-copy format as well as through two on-line formats.

As for OS/2 1.2, which has been available for some time from IBM, it appears that later may be better. Microsoft may be bringing up the rear with plans for a September release of OS/2 Version 1.21 to OEMs, but at least it cushioned the delay by providing some added capabilities, most notably vastly improved printer support and LAN Manager 2.0 compatibility.

About 30 hardware OEMs, including IBM, will ship the product within the next 90 days, according to Microsoft.

OEMs, developers and users have screamed long and loud over a dire shortage of printer drivers. Microsoft had hoped that hardware manufacturers would fill that void, but early this year, in a meeting with the press, the firm conceded it would have to solve the problem itself.

Printing improvements reportedly enable faster and higher quality output to printers, ease printer driver installation procedures via a built-in Presentation Manager printer installer application and support a smaller, faster print spooler.

In networked environments, LAN Manager 2.0 requires OS/2 1.21 on the server but supports OS/2 1.1 and OS/2 1.2 clients.

Microsoft's enhancements also add to the capabilities of functions first introduced in Version 1.2. For example, the high-performance file system features improved operating system response and overall performance improvements. Other upgrades include an enhanced Presentation Manager shell, direct manipulation of icons, a new system editor using the interface and a dual-boot capability to MS-DOS or OS/2.

Separately, Microsoft also released Basic Professional Development System Version 7.1, complete with an updated version of its Programmers Workbench and its programmer's editor, as well as Version 3.1 of the Codeview debugger, the Microsoft Source Browser and additional on-line Advisor documentation. These tools were previously only available under Microsoft C Professional Development Version 6.0.

Also, Microsoft's Professional Indexed Sequential Access Method was significantly updated, now supporting OS/2.

Cumberland looks to PCs to compete in crowded field

ON SITE

BY RICHARD PASTORE
CW STAFF

CANTON, Mass. — Having a convenience store on every block may be a boon for folks with late-night Twinkie cravings, but such a glut may not be so convenient for the companies' bottom lines. At least one chain is looking to in-store computers to provide competitive leverage.

"The industry now is very competitive, almost saturated," said John Carroll, vice-president of MIS at Cumberland Farms, Inc. "Any competitive advantage we can get, whether it's with computers or sales and marketing, is worth pursuing."

To cut corporate labor costs and boost reporting efficiency, the $3 billion privately held convenience chain recently rolled out a personal computer sales and ordering system for its 1,150 stores.

Since January, store managers have been using the computers to log in each day's sales, bank deposits and inventory deliveries. They also input figures for gasoline sales from the company-owned Gulf gas station/store combinations and place orders for Cumberland Farms-brand products. The PCs do the rest, adding and correlating the figures, generating printed reports and uploading the data nightly to the mainframe at headquarters.

The system, known internally as PC Express, replaced a manual operation that was antiquated and inadequate, according to Carroll.

"There was a general consensus here that the system we had was dismal — it was labor-intensive, inaccurate, messy and two to three weeks in arrears," Carroll said.

Store managers formerly spent between one and three hours per day adding up numbers on cash register tapes, posting totals to a worksheet, copying information into a manger's report, and then cross-

Continued on page 40

Cumberland Farms' Carroll

Micro Focus COBOL/2 Workbench™ Is a Hit!

We're very proud of COBOL/2 Workbench. And we're very gratified at achieving a weighted score of 9.6 when measured against corporate buyer preferences in a recent PC Week review.

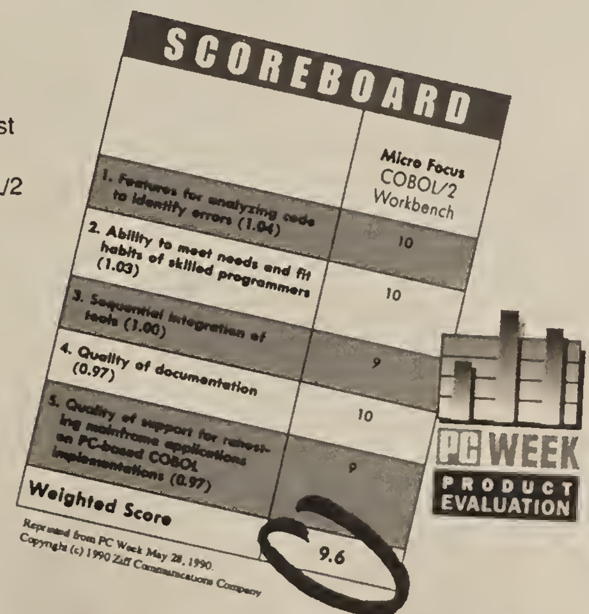
From our mainframe COBOL compatibility features to our easy-to-learn, function key driven menu system, Micro Focus COBOL/2 Workbench is "equipped to support the experienced developer" making a transition from terminals to workstations for programming and maintenance tasks.

And there's more ..."Micro Focus belies COBOL's mainframe heritage with the artful design of the Workbench environment."... and "Micro Focus' debugger, the ANIMATOR, lives up to its name with elegant displays that trace execution through structural diagrams as well as through highlighted source code."

COBOL/2 Workbench is a "superb interactive environment" and "professionally crafted," according to a recent product review.

If you or your organization want to improve programmer productivity, re-engineer existing COBOL applications for new needs, or develop high performance, easy to maintain business applications for PCs, LANs, or mainframes, give us a call at Micro Focus.

We sell "Better Way of Programming" solutions.



SCOREBOARD

	Micro Focus COBOL/2 Workbench
1. Features for analyzing code to identify errors (1.04)	10
2. Ability to meet needs and fit habits of skilled programmers (1.03)	10
3. Sequential integration of tools (1.00)	9
4. Quality of documentation (0.97)	10
5. Quality of support for rehosting mainframe applications on PC-based COBOL implementations (0.97)	9
Weighted Score	9.6

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MICRO FOCUS
A Better Way of Programming™

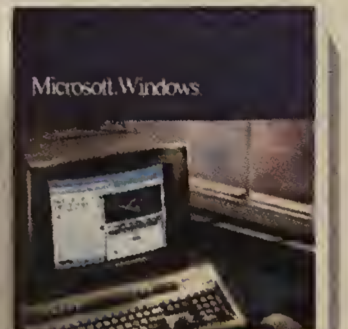
*Call Micro Focus today at **1-800-872-6265** and request a reprint of the entire PC Week review.*

It's only fair to warn you that exposure to new Microsoft® Windows™ version 3.0 has been linked to obsessive and habitual usage. Why?

Because with a simple click of the mouse users can connect to the network, even access and manage network resources. All without cumbersome keyboard commands.

Which means users are now able to share data. Not frustration.

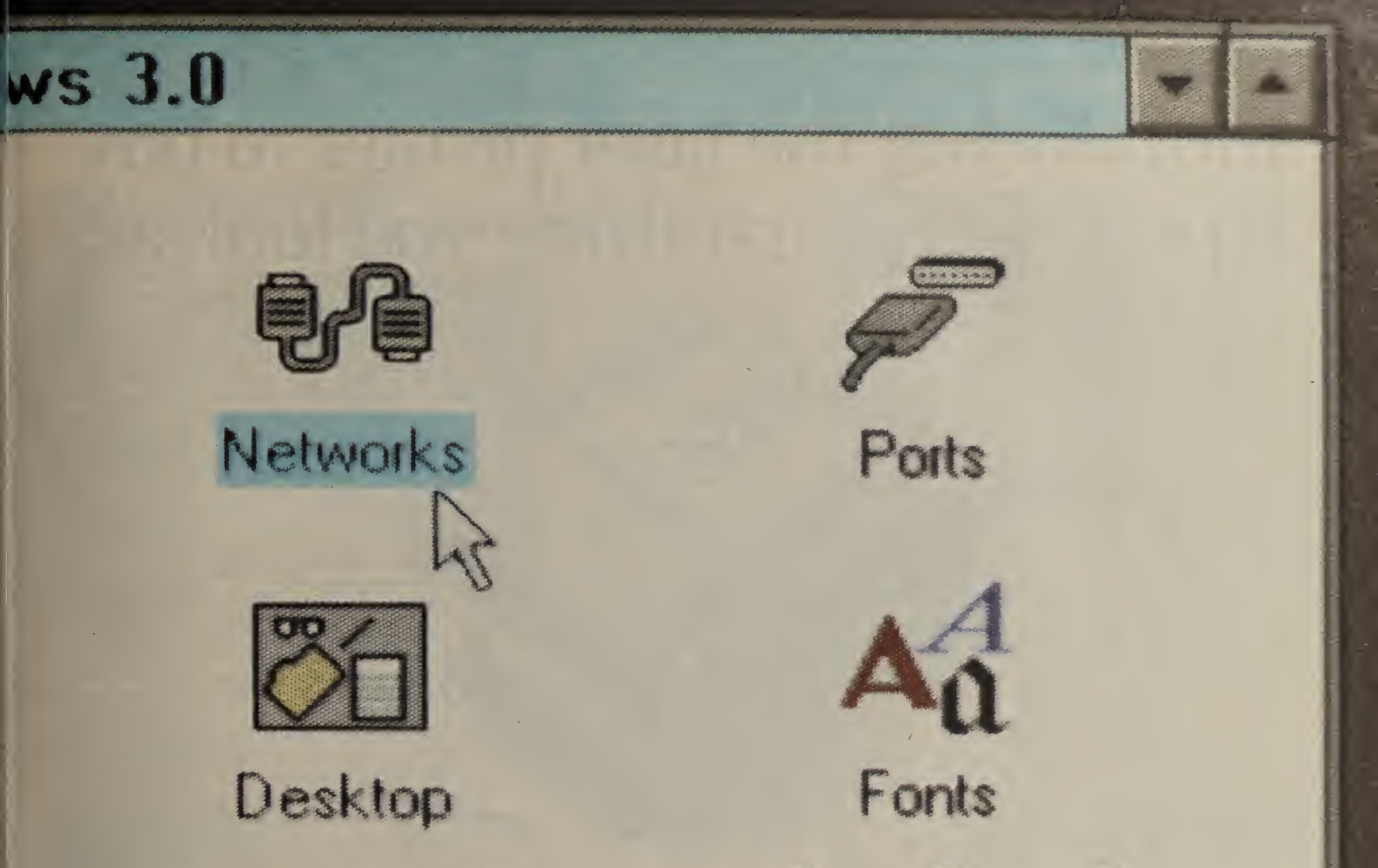
While in the interest of time, the Windows 3.0 graphical user interface was designed to be easy to learn. And use. Neophytes, not to mention troglodytes, will be up and running in no time. With virtually no training.



Now, 286/386™ machines running MS-DOS® will no longer be limited to 640K. So there are no more impediments.

Users can even enjoy a network connection and at the very same time satisfy the cravings of multiple applications.

For more information, call (800) 323-3577, Dept. L21. In Canada, call (416) 673-7638. Outside the U.S. and Canada, call (206) 882-8661. *© 1990 Microsoft Corporation. All rights reserved. Microsoft, MS-DOS and the Microsoft logo*



a point and click hooked.

And since Windows 3.0 has a modular setup program, a single copy now memorizes every user configuration on the network. Which means, so to speak, one size fits all.

Furthermore, Windows 3.0 has redefined its relationship with IBM® 3270 emulation programs. Users can now download corporate data and easily share it with Windows applications. Something we have come to call peaceful coexistence.

One last point. Because Windows 3.0 has been optimized for machines with 1-2 megabytes of RAM, it will go a long way towards protecting your hardware investment.

Call (800) 323-3577, Department L21, for a backgrounder that outlines how Microsoft Windows 3.0 could benefit your corporation.

We're certain that you'll agree it's a habit well worth forming.

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Introducing the laser printer to buy if price is the first thing you look at,

or the last.

	The New IBM LaserPrinter E	HP LaserJet IIP
Speed	✓ up to 5 ppm	up to 4 ppm
Speed upgrade option	✓ up to 10 ppm	No
Adobe PostScript option	Yes	Yes
Printer emulation	✓ IBM, HP PCL	HP PCL
Std. plotter emulation	✓ Yes	No
Font card slots	✓ 2	1
Std. input paper tray capacity	✓ 200	50
Std. output paper tray capacity	✓ 100	50
Opt. sec. input paper tray capacity	✓ 500	250
Opt. envelope tray capacity	✓ 75	20
List price*	✓ $1495	$1495

*Dealer prices will vary.

Any way you look at it, the new IBM LaserPrinter E gives you more for your money than any other laser printer in its price range.

For the same price as the HP LaserJet IIP, the IBM LaserPrinter E gives you all the advantages of laser quality output 25% faster, with four times the paper capacity, twice the number of font slots and double the monthly usage volume.

Plus the IBM LaserPrinter E is unique in its price range because it lets you customize your printer's speed and features to meet your exact needs, at any given moment.

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For example, if you decide you want faster printing, only the LaserPrinter E lets you double its speed.

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Yet no matter how many features you add, the LaserPrinter E's unique stackable design takes up practically no more deskspace.

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PRODUCT REVIEWS

Two solid I486-based choices

Northgate Computer Systems, Inc.'s Northgate Elegance 486 25I and Swan Technologies' Swan 486/25 are both 25-MHz Intel Corp. I486-based computers. The Northgate is in a floor-standing tower case. The Swan is a desktop system with a typical IBM Personal Computer AT-style case. Both systems have Industry Standard Architecture buses.

The Northgate system board has one 8-bit slot, six 16-bit slots and one 32-bit slot, which accepts 8-bit expansion cards. The serial and parallel ports are built into the system board, leaving six slots open after a video adapter and disk drive interface are installed. A Weitek Corp. math coprocessor socket is included.

Northgate Elegance 486 25I

Price: $5,895

- Performance: Very good to excellent
- Documentation: Excellent
- Setup: Good
- System design: Very good
- Support: Excellent
- Value: Excellent

Northgate 25I comes *in a floor-standing tower case*

The tower case has three external, half-height 5½-in. drive bays and two full-height internal bays. Available peripherals include an enhanced keyboard and a 16-bit IBM Video Graphics Array (VGA)-compatible board. The Elegance 486 25I offers a 200M-byte hard disk with IDE 1:1 controller; 1.2M-byte 5¼-in. and 1.4M-byte 3½-in. floppy disk drives; 4M bytes of 80-nsec random-access memory; and 64K bytes of 25-nsec cache memory, expandable to 256K bytes.

The Swan system's AT-style case features a standard drive bay arrangement — three external 5¼-in. half-height drive bays and two internal half-height (or one full-height) bays. The motherboard has eight 16-bit slots, five of which are open after adding a video adapter, an I/O card and disk drive interface. The unit's 16 single in-line memory module sockets are located next to the power supply and under the drive cables.

A Weitek coprocessor socket is also on the board, located in front of the 16-bit slots. Available peripherals include an enhanced keyboard and a 16-bit VGA board.

The Swan offers a 330M-byte hard disk with a small computer systems interface (SCSI) 1:1 controller; 1.2M-byte 5¼-in. and 1.44M-byte 3½-in. floppy disk drives; 4M bytes of 80-nsec RAM; and 64K bytes of 25-nsec RAM cache, expandable to 256K bytes.

Both systems offer fast hard disk times and excellent software compatibility. The Swan has difficulty running with a token-ring network adapter, however. In its default setting, the token-ring conflicts with the system's SCSI hard disk interface.

Swan's *AT-style setup features standard drive bay arrangement*

The Elegance 486 has top-notch documentation. The manual that accompanies the Swan system is also well organized.

The Northgate system's setup is read-only memory-based, and the internal parts can be easily installed or removed; however, there are two small switch blocks that are hard to reach.

The Swan's system design is generic. The front panel has turbo and reset switches, and the system's power switch is located at the back right corner of the case. The Swan's CPU speed can be switched from 25 MHz to 8 MHz via the turbo switch, but enabling the turbo switch disables the system's secondary RAM cache.

Northgate and Swan offer one-year warranties with on-site service, a 30-day money-back guarantee and toll-free support lines. Northgate's lines are open 24 hours per day, 365 days per year. Swan's support lines are open 9 a.m. to 9 p.m. EST.

At $5,895, Northgate's Elegance 486 25I is one of the least expensive 486-based systems on the market. Swan is a solid system at $6,799.

Northgate Computer Systems, Inc., P.O. Box 41000, Minneapolis, Minn. 55441, (800) 548-1993. Swan Technologies, 3075 Research Drive, State College, Pa. 16801, (800) 468-9044.

Swan 486/25

Price: $6,799

- Performance: Very good
- Documentation: Very good
- Setup: Good
- System design: Good
- Support: Very good to excellent
- Value: Very good

Wingz' graphics soar above the competition

Informix Software, Inc.'s Wingz is a spreadsheet for users of Microsoft Corp.'s Windows Version 3.0 or Microsoft's and IBM's OS/2 Presentation Manager. It comes with a full set of features, including a robust set of formulas and many customization options. Its output options are also extensive, but graphics is the area in which it is truly outstanding.

Wingz has the standard assortment of spreadsheet functions, and its Hyperscript scripting language lets users define new functions. It supports multiple regression and what-if tables for modeling, includes many financial functions and has a wide range of matrix calculations.

Wingz can read and write Lotus Development Corp.'s 1-2-3 files and can read Microsoft Excel files. It cannot save in XLS format, but it can write Sylk files. It can also import text, but it does not handle variables properly, and there is no data parse command to separate text strings into numbers. Wingz supports Windows' and Presentation Manager's cut-and-paste functions, so data and graphics from other applications can be brought in via the clipboard.

Wingz has adjustable background recalculation. In manual recalculation mode, users can stop a recalculation with a mouse click. When a complex graph is displayed, there can be significant delays between selecting a command and seeing a response.

Informix Wingz/ PC Version 1.1

Price: $499

- Performance: Satisfactory to excellent
- Documentation: Good
- Ease of learning: Very good
- Ease of use: Satisfactory
- Error handling: Satisfactory
- Support: Satisfactory
- Value: Very good

Graphics capabilities are where this product shines. It has a set of icons representing rectangle, circle, line, text and graph drawing tools displayed on the left side of the screen. The objects created with these tools can be moved, sized and shaded, and drawings or graphs can be mixed with spreadsheet data.

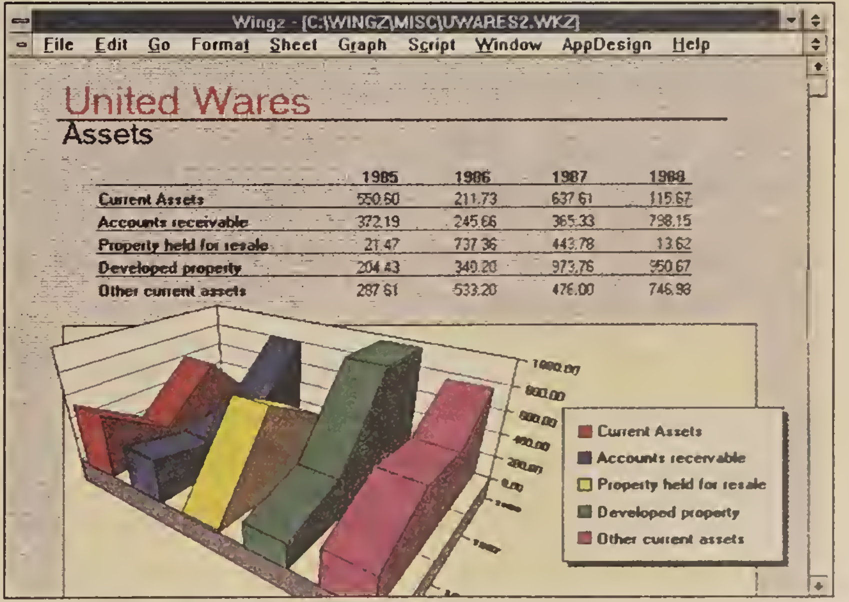
Objects can be cosmetic or functional. One useful object is a button that can be clicked to execute instructions from a script. Scripts can be simple keystrokes played back or complex programs with custom menus, dialog boxes and access to external programs written in C.

Wingz offers an impressive assortment of graph types, including three-dimensional bar, surface and wire-frame charts. Graphs are highly customizable, and just about every part of the image can be changed.

However, there are limitations. For example, creating a graph requires that all data be in a contiguous range. Adding data to an existing chart requires making a copy of an existing range and then redefining it as the additional data series.

Output is handled through the Windows or Presentation Manager drivers and uses those environments' built-in print spoolers. Wingz provides an outstanding selection of color, fill patterns and drop shadows for objects and gives users unprecedented control over the look of the display.

Wingz handles macro chores through Hyperscript. Each worksheet has a "sheet script," and other scripts can be developed that can be executed from any worksheet or attached to specific objects. Hyperscript has no debugging capabilities apart from a syntax check.



Wingz - [C:\WINGZ\MISC\UWARES2.WKZ]
File Edit Go Format Sheet Graph Script Window AppDesign Help

United Wares

Assets

	1985	1986	1987	1988
Current Assets	550.60	211.73	637.61	115.67
Accounts receivable	372.19	245.66	365.33	798.15
Property held for resale	21.47	737.36	443.78	13.62
Developed property	204.43	340.20	973.76	950.67
Other current assets	287.61	533.20	476.00	746.98

1000.00
800.00
600.00
400.00
200.00
0.00
🟥 Current Assets
🟦 Accounts receivable
🟨 Property held for resale
🟩 Developed property
🟥 Other current assets

Wingz allows *the mixing of graphics with spreadsheet data*

Like most modern spreadsheets, Wingz can use cells or ranges from external worksheets by preceding the cell reference with a file name. But Wingz requires that any supporting worksheets be in memory. The product has no automated consolidation feature.

The documentation consists of a well-written user's guide, reference manual and guide to the Hyperscript language.

Free (but not toll-free) support is available weekdays from 8:30 a.m. to 5 p.m. CDT.

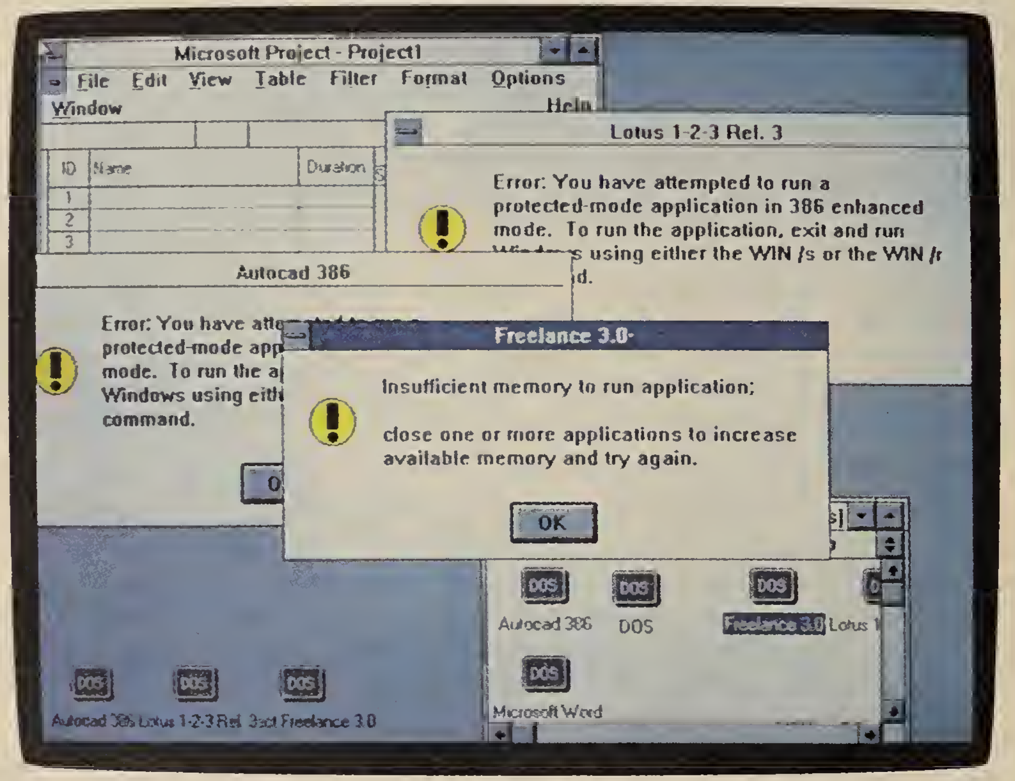
At $499, Wingz may be the top choice for those who develop turnkey spreadsheet-based applications. The program's main fault is its disregard for keyboard users. Many users could overlook its weak file linking and lack of consolidation capabilities in favor of the superb drawing tools and scripting language.

Informix Software, Inc., 16011 College Blvd., Lenexa, Kan. 66219, (913) 599-7100.

Reviews compiled from information supplied by *Infoworld.*

Is Windows 3.0 the end of DESQview™?

Not if you're still using DOS programs.


Microsoft Project - Project1
File Edit View Table Filter Format Options Window Help
ID Name Duration
Lotus 1-2-3 Rel. 3
Autocad 386
Freelance 3.0
OK
Autocad 386
DOS
Freelance 3.0
Lotus 1
Microsoft Word
Autocad 386 Lotus 1-2-3 Rel. 3.ct Freelance 3.0

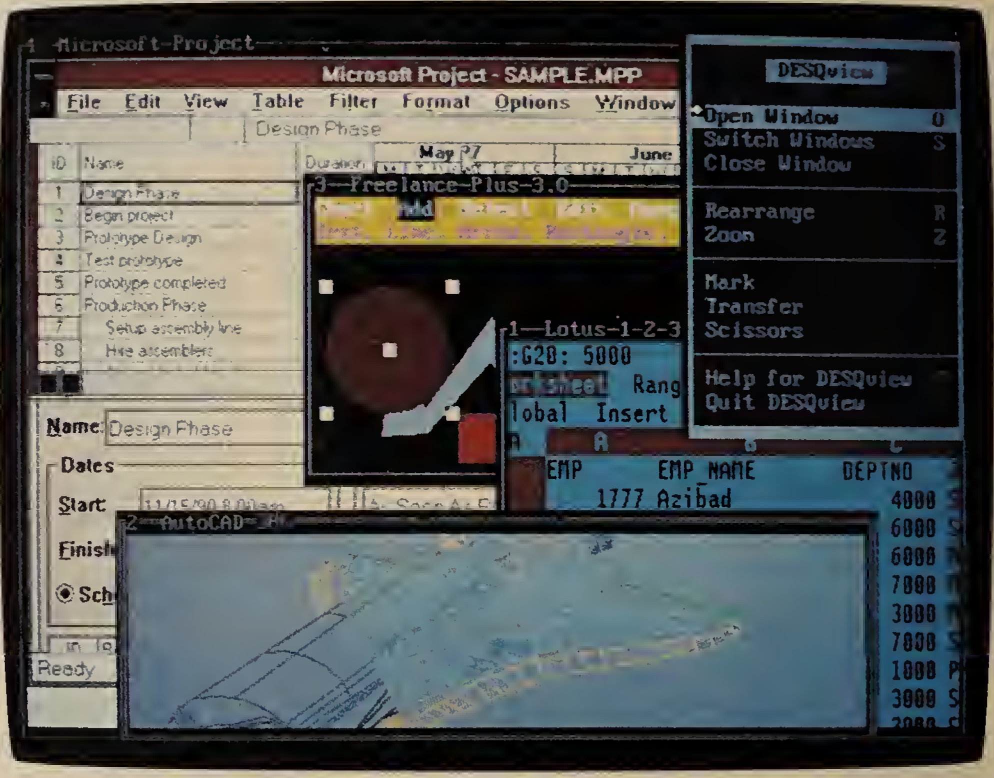
Error: You have attempted to run a
protected-mode application in 386 enhanced
mode. To run the application, exit and run
s using either the WIN /s or the WIN /r
d.

Error: You have atte
protected-mode app
mode. To run the a
Windows using eith
command.

Insufficient memory to run application;

close one or more applications to increase
available memory and try again.

Windows 3.0. The multitasking, windowing environment.



DESQview 386 2.3. The multitasking, windowing environment.

Are you still using MS-DOS programs on your PC?

You may want to use DESQview as your primary operating environment.

The new DESQview 2.3 and DESQview 386 2.3 let you use your favorite DOS and DOS-extended programs in windows side-by-side on 80286, 80386 and i486 PCs. As you can see above, you can even run Windows programs within DESQview 386. So the next time you get error messages like the ones at the left in Windows, remember how the same set of programs look running in DESQview.

Whatever standard you use—DOS, extended DOS or Windows—DESQview is still the best way to get the most out of the hardware and software you own today.

DESQview. The obvious choice.

Quarterdeck

Quarterdeck Office Systems, 150 Pico Boulevard, Santa Monica, CA 90405 (213) 392-9851 Fax: (213) 399-3802

This comparison was made using a system like the one you might run: Both shots show an ALR FlexCache 33/386 running DOS 3.3 with VGA display adaptor, Novell NetWare v3.01 Rev. A, with IPX/SPX v3.01 Rev A, Microsoft Mouse 7.00, and Microsoft SMARTDrive v3.03 disk cache. Buffers were set to 20. For the Windows screen, we ran Microsoft Windows 3 HIMEM.SYS and EMM386.SYS. For the DESQview screen, we ran QEMM 386 v5.1.

Trademarks: Microsoft, Windows, MS-DOS, 80386, i486, ALR, FlexCache, Novell, NetWare. ©1990 Quarterdeck Office Systems

Next-based Frame Maker falls short

PRODUCT REVIEW

Frame Maker 2.0B from Frame Technology Corp. is a what-you-see-is-what-you-get documentation program that combines word processing, graphics integration and layout capabilities. It is being co-marketed with Next, Inc.'s Unix-based Next workstation. In fact, it is the only publishing program available for the Next system.

The Next computer contains a 25-MHz Motorola, Inc. 68030 CPU, a 68882 math coprocessor, a 56001 digital sound processor and 8M bytes of random-access memory, which is expandable to 16M bytes. It also includes a standard 256M-byte erasable optical disc drive; a small computer systems interface connector and two drive bays for optional hard disks; a thin Ethernet connector; and two serial ports. It comes with a 17-in. gray-scale high-resolution monitor with 92 dot/in. resolution. A proprietary Adobe Systems, Inc. Postscript-compatible laser printer with 400 dot/in. resolution that attaches by mounting a card inside the Next is available.

Frame Maker (Next)
Version 2.0B

Price: $995

- Performance: Poor to very good
- Documentation: Poor
- Ease of learning: Poor
- Ease of use: Good
- Error handling: Very good
- Support: Satisfactory
- Value: Good

The Next Step graphical user interface is mouse-driven and operates with icons and tear-away menus. It runs on top of the Mach operating system, giving average users an easier interface with which to work but allowing programmers to access Mach for development.

A number of software packages are bundled with the Next, including graphical versions of Webster's dictionary and thesaurus that can be called up from within Frame Maker.

Frame Maker operates using a series of pull-down menus and mouse-accessible features. Its limited word processor support and inability to export text limit users to doing word processing in its internal editor, which has executive word processor editing capabilities, sophisticated spell checking and search-and-replace capability.

The program uses style sheets to aid composition, and a comprehensive set of drawing tools allows users to manipulate graphics quite extensively. Notable limitations are the lack of editing features for bit-mapped images and the lack of support for business graphics or charting.

The program relies on outside products for image editing. In a networked environment, the inability to link source text files with a layout for version control hinders work group publishing. However, Frame Maker does well in its integration of outside graphics as well as with its interactions with other programs in Next's multitasking environment. Hot links can be established with other Next applications, and hypertext connections can be generated between documents.

Frame Maker does not wrap text around graphics. Instead, users must cut and manually resize the text columns affected by a wrap. An exception are frames anchored to a spot in text with the powerful frame-anchoring feature. However, such frames are limited to the width of the column.

Frame Maker offers standard high-end typographic controls. While its quote conversion does not work on imported files, it offers the ability to select multiple line-break characters, such as hyphens, slashes and dashes. It supports type sizes and leading in one-thousandth-point increments from four to 400 points. It does not let users override size and position settings for superscripts, underlines and other similar attributes.

Creating multi-element layouts in Frame Maker is difficult, and although Frame Maker offers basic table-making capabilities through its tab stops, it is not automated or sophisticated.

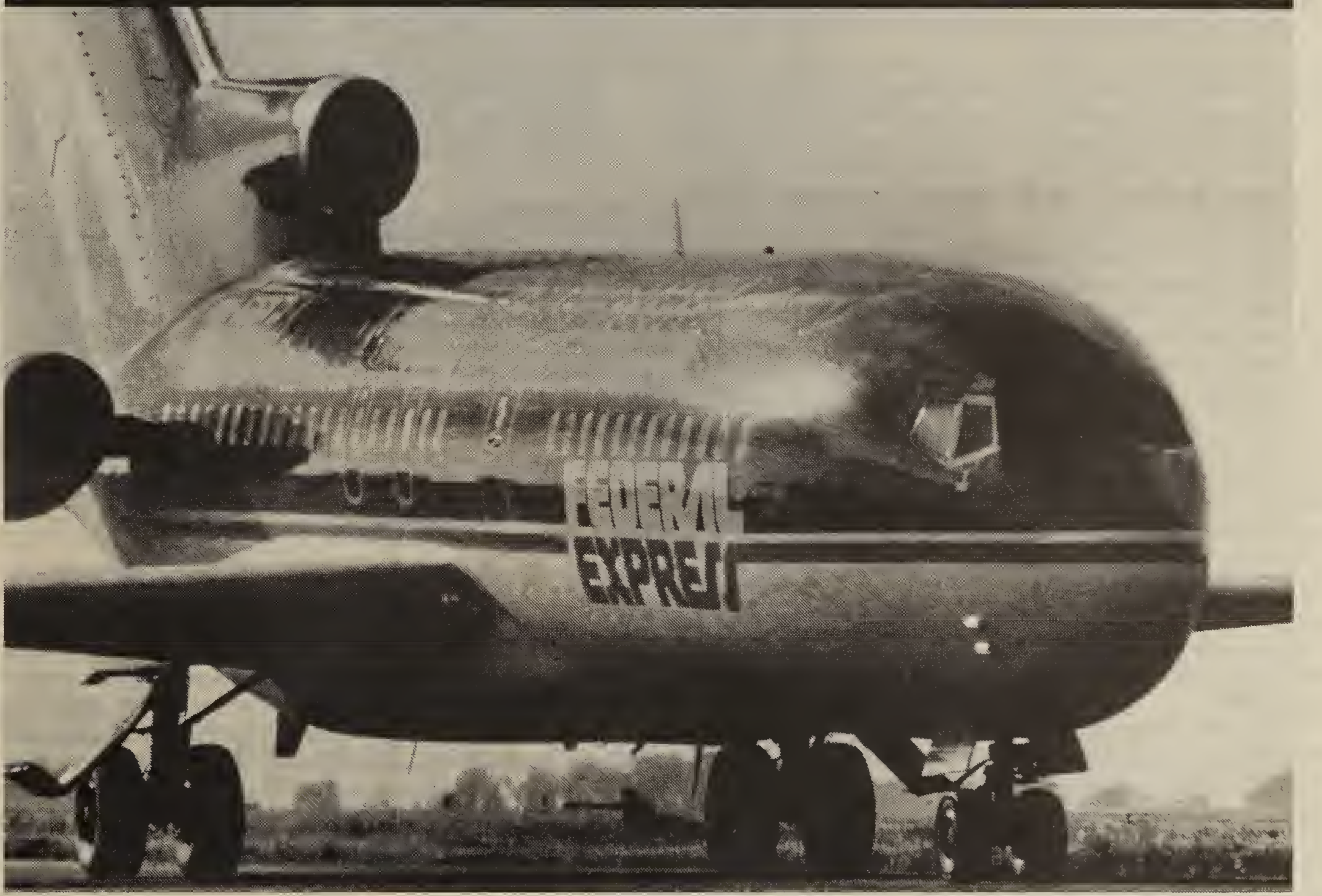
Frame Maker comes with several manuals. Unfortunately, information is hard to find because of awkward organization, a spotty index and omitted details.

Frame Maker is not easy to learn, but once learned, it is easy to use. Despite the impressive Next hardware, the program runs slowly.

Technical support is available to registered Frame Maker users for only 30 days via a toll call. An annual support contract costs $199. There is also bulletin-board and fax support. Support for the Next computer is offered through dealers.

Frame Maker lists for $995. For users who are already in the Unix environment and need to produce documentation — whether paper or hypertext — the Frame Maker/Next combination is a fine deal.

Frame Technology Corp., 1010 Rincon Circle, San Jose, Calif. 95131, (800) 843-7263. Next, Inc., 900 Chesapeake Drive, Redwood City, Calif. 94063, (800) 848-6398.



XEROX

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CRTs still king of the desktop

New display technologies have failed, so far, to displace the old standby

ANALYSIS

BY MICHAEL FITZGERALD
CW STAFF

Every now and then people start to question the future of the CRT, which seems too ancient a technology to be so essential in modern computers. Those people say the advent of new display technologies such as LCD, gas plasma and electroluminescence make the CRT's days look numbered. Worse, fear of alleged health hazards posed by VDTs seems to be reserving a space for CRTs in the graveyard soon.

Don't bet on it.

While flat-panel displays dominate the portable computing market — which San Jose, Calif., market research firm Dataquest, Inc. estimated will hold approximately 40% of the personal computer market in 1993 — CRTs will continue to dominate the desktop for the foreseeable future. CRT terminals outperform flat-panel technologies significantly in every category other than low-power or limited space environments.

So, while Dataquest predicts that some 10 million flat-panel displays will be sold in 1993, those figures virtually match its estimates for portable sales.

Flat panels are naturals for portables, which require small screens that use little power. CRT terminals must house a vacuum tube and require much more power.

The various flat-panel technologies offer several size-related benefits. They can be made large or small much more easily than CRTs. However, the price difference is staggering. And when a manufacturer makes a larger-than-laptop flat-panel display, costs can skyrocket. Digital Equipment Corp. offers a full-sized electroluminescent monitor for $7,995, whereas a conventional monitor costs approximately $3,300.

Cost, more than anything else, is what holds flat panels back from the commercial marketplace, according to Norman Weizer, a senior consultant at Arthur D. Little, Inc. in Cambridge, Mass.

Weizer said that, other than in portable computers, most flat-panel technologies are used for military rather than commercial applications, and they do not have much to do with the desktop.

Those commercial uses that do exist are in fields such as point-of-sale terminals or instrument control panels. Some banks use flat terminals instead of CRTs at teller stations.

Weizer said he does not see flat panels challenging CRTs in the commercial market for at least three to five years.

> "PEOPLE LOOK AT it from a technology standpoint — a CRT is a vacuum tube. That's a first-generation technology."
>
> JACK ROBERTS
> DATAQUEST

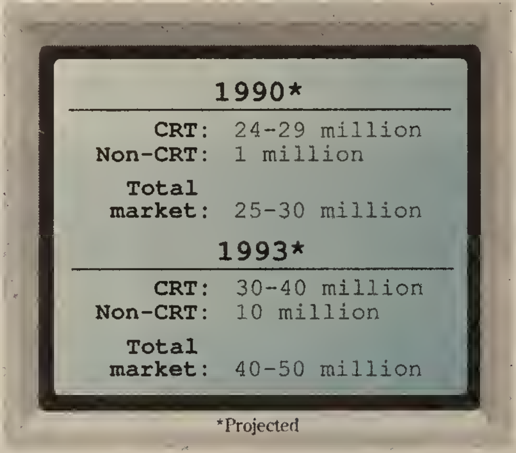
Jack Roberts, senior industry analyst at Dataquest, took an even longer view, saying that perhaps in 10 years CRTs will become a less potent force in the market. Then he wryly noted, "I would've said the same thing 10 years ago."

This economist-like ability to completely misforecast comes from technology blinders, Roberts said. "People look at it from a technology standpoint — a CRT is a vacuum tube. That's a first-generation technology."

According to Roberts, it is easy to say that five years from now, a new technology will have developed that is both as good and as cost-effective as CRTs. He also said that there are technologies today that are better than CRTs were five years ago. So why does the CRT still dominate the market?

Scratching the surface

CRT displays still hold at least a 24-to-1 advantage over non-CRT technologies. But that could change in coming years



	1990*
CRT:	24-29 million
Non-CRT:	1 million
Total market:	25-30 million
	1993*
CRT:	30-40 million
Non-CRT:	10 million
Total market:	40-50 million

*Projected

Source: Dataquest, Inc. CW Chart: Doreen Dahle

"I've seen 10 years worth of these projections [predicting the end of the CRT], and they fail to take into account that the CRT moves forward, too," Roberts said. "There have been improvements in the area of performance and costs of CRTs that we didn't anticipate."

However, flat-panel quality is getting much better, and flat-panel displays could begin to pick off some sales from CRTs. Webster Howard, manager of flat-panel display technologies at IBM's T. J. Watson Research Center, sees the portable market as a stepping-stone to the desktop.

"[Portables] are the big area where you can get started against CRTs," Howard said. "It's projected to be a very large market, so it means that there's an opportunity to get established and get costs down."

From there, Howard said he thinks that the high-end workstation market, with its expensive CRTs, is the logical attack point, after which the desktop market may be vulnerable.

Howard said he expects that nonportable, flat-panel displays will be on some desktops within two years. "There are people who are very sensitive to the size restrictions of the CRT," Howard said. "People in the financial markets who run the trading exchanges, they don't have room or power capacity for any more CRTs. They are eager to get good flat-panel displays, and they'll pay a premium. In Japan, space is at a very high premium. They will be early users of these machines."

Roberts said he doubts either research into high-definition television or health issues will have much impact on CRT use.

CRT makers can provide more effective radiation shields if the market calls for them. In some opinions, power lines, electric blankets, airplane rides and televisions are all at least as dangerous as computer monitors.

NEW DEALS

Orkland nabs $13M contract

The **U.S. Postal Service** has awarded **The Orkland Corp.** a two-year contract to provide technical service and administrative personnel on-site at the Postal Service's National Address Information Center in Memphis, Tenn. Orkland staffers will support various address technology management systems at the site.

Virginia Polytechnic Institute and State University announced that incoming computer science students will be required to buy **Commodore Business Machines, Inc.**'s Amiga 3000 running AT&T's Unix System V.4. The decision to go with the Amiga ends a three-year standardization effort on **Apple Computer, Inc.**'s Macintosh running AU/X.

J. C. Penney Co. said it will install **NCR Corp.** point-of-sale (POS) workstations in 1,330 stores nationwide, replacing existing terminals. The contract, valued at more than $45 million, includes orders for 16,400 NCR 7052 POS personal computer-based workstation systems and 1,600 NCR 7052D integrated-disk POS workstation systems as well as peripheral equipment.

Cumberland

FROM PAGE 33

referencing the report and worksheet and mailing the paperwork to headquarters.

At headquarters, 50 to 60 people were employed to open the mail, edit the reports and key them into the IBM 3090 mainframe. The total time to process a daily report and generate hard copies was 1½ to two weeks.

If an area supervisor desired a sales report on the eight to 10 stores in his jurisdiction, he had to wait two more weeks for the papers to arrive via an improvised delivery system. "We sent reports out on bakery trucks, milk trucks, any way we could. But by that time, the information was history," Carroll said.

Things have changed. Store managers now spend less than one hour compiling reports. The accuracy of the numbers has increased because the machines do the addition and flag errors.

Now the information reaches the mainframe nightly, boosting its timeliness and usefulness. Without the need to rekey the data, most of the data-entry staff has been eliminated, mainly through attrition. Also, the area supervisor no longer has to wait for the milk truck to show up. He can walk into any one of his stores with a floppy disk and poll the day's information himself.

"The labor cost savings alone funded the entire program," said Carroll, who said he expects a return on investment in 18 to 20 months.

The dipping cost of PCs helped propel the project, Carroll noted. Cumberland Farms tapped NCR Corp. as its primary vendor because of its experience with NCR's cash registers as well as the vendor's very competitive bid and national representation. Cumberland Farms purchased NCR's 3392 PC, a box equivalent to IBM's Personal System/2 Model 30.

> "THE LABOR COST savings alone funded the entire program."
>
> JOHN CARROLL
> CUMBERLAND FARMS

The store PCs are connected via dial-up lines to a local-area network of 20 NCR polling PCs at headquarters. The headquarters boxes, linked by a Novell, Inc. token-ring network, consolidate the data into an IBM PS/2 Model 80, which in turn feeds the information to the mainframe over a 3270 link.

The homegrown software, written with Nantucket Corp.'s Clipper, was completed in two to three months using an outside programming consultant.

The system took only three months to roll out, said Carroll, who attributed the speediness to a relatively unusual team effort. "I consider this one of the best team efforts this company has been through," he said.

Representatives from finance and accounting, human resources, auditing, administrative communications and sales and operations joined the information systems squad in developing, refining and implementing PC Express.

"The main reason [the system] was so successful is because everybody has a little bit of ownership," Carroll said. "We were so successful in doing this that we're trying to get this group involved in future projects."

Carroll is piloting new batch-polling software that would eliminate most of the polling machines at headquarters. He has also set his long-range goal on an integrated point-of-sale system, which would send credit-card grocery and gasoline sales data directly from the cash register to the PC. Because it would be an expensive proposition at $8,000 to $12,000 per site, there is still a lot of work to do to justify the cost, Carroll said.

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Keefe

FROM PAGE 33

ly made [CW, Aug. 20], where he not only acknowledged that IBM got a little bent out of shape after Microsoft publicly poured water on its 2M-byte OS/2 plans but further conceded that the two companies have stopped trying to "hide" their differences.

In the words of St. Mark, later paraphrased by Abe Lincoln, "If a house be divided against itself, that house cannot stand." Clearly, divisive cracks exist in the IBM/Microsoft foundation. To explain, Ballmer noted that OS/2 did not sell anywhere near what Microsoft, IBM and many others had predicted.

"When things aren't selling in the volumes expected, things get tough," he said. So both companies tried to figure out what to do. "The good news is that there are a lot of good ideas. Now we're in the process of trying to get those ideas to agree," he carefully explained.

IBM and Microsoft have numerous areas of disagreement, stretching at least as far back as Microsoft Networks (MS-Net), Microsoft's first ill-fated foray into networking software. By the time IBM got through with its version of MS-Net, the two were barely kissing cousins.

In the last two years, the two powerhouses have produced different file servers based on the same core; disagreed, agreed and now are back to disagreeing over the role Windows should play; bickered over and blessed competing font types; and wrestled over the disposition of IBM's Hursley, England-based team of OS/2 programmers. It's probably fair to say that since the November 1989 declaration of unity, the gulf between the two micro giants has widened considerably in a much more public light than ever before.

The end result for users has always been confusion. Are the two versions of whatever the same? When will they be compatible? If they are different, whose should you buy? Is there *any* coherent desktop operating system/environment strategy that you can plan around? Can you bank on any statement of direction that IBM and Microsoft jointly present?

Then there are the "what ifs." What if a piqued IBM went its own way on OS/2? This is not so farfetched. It contemplated doing just that with "PM Lite," which was supposed to be a slimmed-down version of OS/2 Presentation Manager. Microsoft opposed the idea, which had support from some key developers. After a barrage of negative press followed a carefully timed leak, however, that trial balloon lost IBM's stamp of approval.

Also, IBM already delivers new OS/2 releases before Microsoft's OEMs. It also is the sole provider of Extended Edition, which consists of its Communications Manager and Database Manager bundled with vanilla OS/2, and may be the sole provider of a 2M-byte OS/2.

IBM is showing signs of standing its ground on OS/2 1.3 — no matter what Microsoft does. Ballmer did say that if OEMs want it, Microsoft will ship it. But OEMs and resellers probably would prefer not to have another SKU to track, particularly if it doesn't qualify as a Great Leap Forward.

There are also reports that IBM is using OS/2 1.3 to attack Windows 3.0 in sales pitches. If this is true, it's a bad way to atone for missing the Windows boat. If IBM picked up the threads of PM Lite, it would cut off its nose to spite its face.

All this energy would be better spent providing technical innovators with the tools and support they need to migrate over to a single OS/2 standard. Sowing more seeds of confusion by offering opposing agendas to Microsoft's doesn't help users, developers or the industry. This isn't to say that Microsoft's strategy is the way to go. What we need here is a little less bickering, a little more negotiating and a single strategy to bank on.

Keefe is *Computerworld's* senior editor, PCs and workstations.

NEW PRODUCTS

Software applications packages

Dynalink Technologies, Inc. has announced a system clipboard viewer and screen capture program for users of IBM's OS/2 Presentation Manager.

Clip'n Save Version 1.2 serves both as a viewport to any bit-mapped image on a system clipboard and as a screen capture program. Other features include five alternatives for capturing screen images and systemwide hot keys that are said to allow active windows or desktop applications to be captured at any time.

The product is available for $149.

Dynalink
32 Courval
Kirkland, Quebec
Canada H9H 3W6
(514) 630-7663

Coromandel Industries, Inc. has announced a transaction-based data management tool that is compatible with Microsoft Corp.'s Windows Versions 2.11 and 3.0.

C-Trieve/Windows enables developers to build large custom data management applications in C or C++ while using less code. The X-Open standard-based product allows applications to be moved across DOS, Windows, Unix, Xenix, or Sun Microsystems, Inc.'s Sun OS environments without the need to rewrite code.

It runs as a separate application under Windows and costs $395.

Coromandel Industries
7-15 Austin St.
Forest Hills, N.Y. 11375
(718) 793-7963

Cadware, Inc. has announced a personal computer-based software documentation tool and computer-aided software engineering (CASE) learning aid.

Smartcase includes a mouse-driven, point-and-place, icon-based interface. Interactive rule checking and three context-sensitive Help features provide Smartcase users with on-line training for CASE applications.

The product is available in MS-DOS and OS/2 versions, which are priced at $299 and $349, respectively.

Cadware
50 Fitch St.
New Haven, Conn. 06515
(203) 397-2908

Autosight, Inc. has announced a specialized personal computer tool for making Autodesk, Inc. Autocad Data Exchange Format files readable by other computer-aided design systems.

Autosight DXF Handler II can be used to modify text layers, sizes and styles; move text to and from specified layers; create new layers; and facilitate batch processing, according to the vendor.

The product runs on IBM Personal Computer XTs, ATs, Personal System/2s or compatibles and requires 512K bytes of memory and MS-DOS Version 2.0 or higher. It costs $195.

Autosight
P.O. Box 362086
Melbourne, Fla. 32936
(407) 242-5865

Systems

Sony Microsystems Co. has introduced the News 3710, an addition to its News workstation family.

Model 3710 is based on Mips Computer Systems, Inc.'s 20-MHz R3000 reduced instruction set computing microprocessor. It can be used for applications such as electronic design automation, computer-aided design and computer-aided software engineering. It features processing power of 17 million instructions per second and includes a 286M- or 640M-byte internal hard disk.

Pricing ranges from $6,800 to $18,200, depending on configuration.

Sony Microsystems
651 River Oaks Pkwy.
San Jose, Calif. 95134
(408) 434-6644

Unisys Corp. has announced that it plans to package Microsoft Corp.'s Windows Version 3.0 with its Unisys Personal Workstation^2 (PW^2) family of network servers and personal computers.

Windows 3.0 enables networked PW^2 users to share resources, connect and disconnect network disk drives and printers and control local and network printing.

The product is being offered with MS-DOS for all PW^2 systems. The MS-DOS/Windows 3.0 package costs $195, and an upgrade kit for current users of Windows 2.1 sells for $50.

Unisys
P.O. Box 500
Blue Bell, Pa. 19424
(215) 986-2214

Corvallis Microtechnology, Inc. has introduced the MC-V-NQ, part of its series of handheld personal computers.

The product features 256K bytes of random-access memory, two built-in RS-232 interfaces and an optional internal 1M-byte RAM disk. It was designed for companies that perform data collection applications such as inventory tracking, inspection and warehouse inventory control. It costs $1,450.

Corvallis
413 SW Jefferson Ave.
Corvallis, Ore. 97333
(503) 752-5456

Data storage

Raima Corp. has announced that its Dynamically Linked Library (DLL) version of DB Vista III (DB Vista 3.15) for Microsoft Corp.'s Windows Version 3.0 supports Asymetrix' Toolbook 1.0, a software construction set that enables IBM Personal Computer users to develop applications that address business, education and multimedia markets.

DB Vista III was designed for C language applications development and includes a database engine with a DLL and an SQL query and report writer. Pricing for the product starts at $595.

Raima
3245 146th Place S.E.
Bellevue, Wash. 98007
(206) 747-5570

Candlelight Software, Inc. has announced Windowsmaker, a software package that allows users to develop graphical user interfaces for Microsoft Corp.'s Windows Version 3.0.

The product allows Windows applications to be created in C by pointing and clicking on options and objects. Its code generator produces C source code that includes the Windows user interface and supports links to subroutines and internal functions.

The product lists at $795.

Candlelight Software
2375 E. Tropicana Ave.
Las Vegas, Nev. 89119
(702) 456-6365

Outbound Systems, Inc. has announced that it will begin shipping an external floppy disk drive for its Apple Computer, Inc. Macintosh-compatible laptop computer.

The 3½-in. Apple Superdrive-compatible drive can read and write any 400K-, 800K- or 1.4M-byte Macintosh disk format as well as 720K- and 1.44M-byte DOS disk formats.

The product is priced at $349.

Outbound Systems
4840 Pearl East Circle
Boulder, Colo. 80301
(303) 786-9200

Who's the only branch automation company involved with E.I.S.A.?

COMMENTARY

Elisabeth Horwitt

Decisions, decisions

The following ditty is presented with apologies to The Lovin' Spoonful:

Did you ever have to make up your mind? To say yes to one communications platform and leave the other behind? There's so many protocols that aren't yet defined. Did you ever have to make up your mind?

Evidently, this tuneful dilemma still hasn't hit home for IBM. The vendor has long been facing its customers with an evermore-confusing array of midrange processor families that overlap in terms of functionality, upgradability and price/performance. Now IBM is further confusing the issue by apparently grooming its RISC System/6000, Enterprise System/9370 and Application System/400 lines as starters in the Great Communications Platform race.

The stakes are high, because users very much want a single platform that will interconnect various types of local-area networks to various types of popular (non-IBM) communications environments. Several members of the bridge-router-gateway contingent are attacking this problem, but they really can only bite off small pieces of

Continued on page 46

Connecting on Capitol Hill

Modernizing systems for the U.S. Senate is a truly political undertaking

ON SITE

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — Information systems managers who see their users as demanding but technologically naive would sympathize with Robert D. Harris, director of IS and technology at the U.S. Senate. Harris has just embarked on the formidable job of overhauling the Senate's nationwide data network — a combination of local-, metropolitan- and wide-area networks that will be used by 5,000 senators, staff members and committee personnel at 550 sites on Capitol Hill and around the country.

By almost any measure, the new network is a big step forward for the Senate. Transmission speeds, security, reliability and flexibility will all be boosted while operating costs should be reduced. But for Harris, the challenge may be more one of managing expectations than technology.

"We've got 100 senators and 26 committees. Some want to be on the bleeding edge of technology," Harris said. "They'll say, 'I saw something at a trade show last week. Why can't we have that?' Others will say, 'I've got a dumb terminal I've been using since 1972, and I don't want to give it up.' "

The Senate just handed the 10-year, $65 million job of installing and running the network to McLean, Va.-based Planning Research Corp. Planning Research will deploy the Senate Data Communications Network, a packet-switched network based on the CCITT X.25 protocol. A 56K bit/sec. backbone linking Senate offices in home states will be based on U.S. Sprint Communications Co.'s public data network service, Sprintnet (formerly Telenet). Users in senators' state offices will tap into Sprintnet via dial-up or dedicated lines at 9.6K bit/sec. — eight times faster than is now possible.

On Capitol Hill, a metropolitan-area network (MAN) will span five buildings and link 110 minicomputers from Data General Corp., Prime Computer, Inc. and Bull HN Information Systems; 39 3Com Corp.-based Ethernet LANs; 2,000 standalone personal computers; and 4,000 dumb terminals. Links at 56K bit/sec. will connect the MAN to Sprintnet and to IBM mainframe hosts at the Senate, the House of Representatives and the Library of Congress. All traffic will flow through Digital Communications Associates, Inc. (DCA) packet switches or

Continued on page 44

Study examines in-house integration

BY SALLY CUSACK
CW STAFF

VIENNA, Va. — True multivendor network integration experts are indeed a rare commodity, and many information systems shops across the country are tackling integration jobs with inhouse resources and personnel, a recent study reported.

According to a report by Input, a Mountain View, Calif., research firm, both business and technological issues are evolving to increase demand for multivendor connectivity. "Finding a vendor that can deal with management issues while piecing together a comprehensive technology is essential," said Alex Graham, principal consultant at Input.

Results of the survey revealed that many integration projects are done by in-house personnel. Selected from a broad range of companies, almost 80% of the respondents said they had either already completed a network integration project or were currently involved in one, and 97% percent of those surveyed said they would be undertaking such a project within the next five years.

Of those who had already implemented an in-house strategy, most respondents indicated that outside vendors either did not have the technical expertise to advise them competently on network integration or did not know enough about the particular business to add any information of significant value.

Understanding goals

"The real issue for these vendors is to determine just what a particular organization is trying to accomplish by integrating networks," Graham said. "If, for example, the purpose is to tie everyone together, does that mean that everyone has access to all data residing on a network? And just who will decide who gets access to what? These are issues management must resolve."

Users seem to be meeting with reasonable results while going it alone, but it is a time-consuming task. Joe Duran, supervisor of computer operations at the Lower Colorado River Authority in Austin, Texas, said that his company knew at the outset "exactly what the objectives were and just what needed to be accomplished."

The state agency currently has 600 Intel Corp. 80286-based personal computers and three Novell, Inc. local-area networks scattered over eight different locations and is implementing a plan to connect all the LANs to an IBM 3081 mainframe over coaxial and microwave links.

Graham said he feels that integration vendors must be well-versed in voice and data communications, LANs and wide-area networking to meet the demands of today's technological market.

Who was the first bank automation company to produce a computer with 486 chip technology?

Here's a hint: It's not IBM or DEC.

Campus network high achiever

After installing its first LAN, UCSD realizes benefits of data sharing

ON SITE

BY JIM NASH
CW STAFF

Three years ago, a professor at the University of California, San Diego (UCSD) achieving a research breakthrough might have shared her discovery with colleagues via electronic mail.

At the same time, a department head spotting potentially disastrous accounting problems through his spreadsheet program would have had to pop the floppy into his briefcase, board a shuttle and load the disk into another personal computer to show it to his superior.

The 2,000 administrators working on their 1,000-workstation network today at UCSD have put away their campus bus passes. The university has made the connection that data sharing benefits administration as much as academia.

It was newcomer Steve Relyea who "got fed up" with UCSD's "Sneakernet" in 1987. Relyea had moved from the University of California, Irvine the year before to become vice-chancellor for business affairs at UCSD.

"On the administrative side," he explained, "we didn't have much. It was kind of the Dark Ages — a few PCs, but no E-mail, no data communications." Relyea said he was only waiting for the local-area network industry to mature.

Networking advocacy is not the norm at most firms, said Steve McQuarry, UCSD's communications software development engineer. "Most organizations are trying to get the word up to the top. This time the word was coming *down*," he said.

UCSD's Relyea *was fed up with the university's 'Sneakernet'*

That advocacy hit high gear in 1987. Relyea said that the industry finally offered the security, fault tolerance and reliability he felt was needed in order to run PCs at a major university.

It is difficult to imagine a more confusing environment to organize electronically. Scuff an ant hill and watch the activity. That is what UCSD looked like recently as students, teachers, administrators and construction workers swarmed through the labyrinthine campus. It is virtually impossible for anyone short of a San Diego graduate to navigate UCSD easily. Complicating matters is $500 million worth of construction that is turning the 1,800-acre campus inside out.

"One of the toughest things to do is anticipate the building program and how it is going to affect communications," Relyea said.

Why did he pick up such a trouble-prone project? "It was a combination of my being very new," he said, "and my having to deal with the immense geographical dispersal of the campus." For example, UCSD's medical center is 12 miles south of the core, and a new switching station is 20 miles northeast of the campus.

From the outset, Relyea sought to standardize the system. He said he chose a PC LAN over academia's host model to preserve the school's investment in its few administrative microcomputers. He experimented with Banyan Systems, Inc.'s Virtual Networking Software and Novell, Inc.'s network operating systems before choosing Novell Netware.

"It was a really tough choice. I feel we would have made it work either way," Relyea said. "Banyan had better wide-area network tools, but Novell had such a commanding market share and third-party support." Banyan's requirement for its own proprietary servers also helped his decision, he said.

McQuarry said they were just as picky with E-mail. They first tried Novell's package, but the users disliked its clumsiness. CC:Mail, Inc.'s CC:Mail eventually won out, he explained.

The first network was a Netware 286 Version 2.0A in the personnel department in 1988. "They were really champing at the bit," Relyea said. While other departments were dubious about the plan, "personnel was saying, 'Bring it on.' " He said he figured a successful network would evangelize itself in personnel because of the department's integral role in the other departments.

Relyea said linking users in only one department the first time out taught him to continue that pattern. At the time, he had only the money and manpower to tackle one department. But concentrating singly reduced confusion and mistakes, he said.

McQuarry said resistance to networking melted in even the most hardened departments. "Once people saw electronic transfer of files, that's when things started changing." LAN E-mail had a particularly strong effect on users. McQuarry said that E-mail had existed before, but it was a dial-up service to a PC running The Santa Cruz Operation's Xenix. Making E-mail easier to use opened up lines of communication that had never even existed before, he said.

UCSD now supports networks in 53 departments with 67 file servers on an Ungermann-Bass, Inc. broadband backbone that is slowly being switched to fiber optics, McQuarry said. IBM's Personal System/2 Model 70 is the standard workstation; the Model 80 is the standard server.

Bamboo curtain

Sometimes administrators have to go far afield to find the reason for failing networks. Steve Relyea, the architect behind the 1,000-workstation network at UCSD, thought he had tried everything with one faulty remote link.

Relyea could not figure out why the high-speed digital microwave communication link connecting the university's Sorrento Valley telecommunications center with the rest of the campus was having periodic failures. "We tried everything in the book and couldn't find what was causing the problem," he said.

Someone at the site told him that things got worse on windy days. When the crew walked out to the microwave dish, they saw a tall strand of bamboo in front of the device waving in the gusts. "We trimmed [the bamboo shoots], and suddenly, we had 100% performance."

JIM NASH

Capitol Hill

FROM PAGE 43

packet assembler/disassemblers (PAD).

Networking software will conform to the Government Open Systems Interconnect (OSI) Profile, a set of OSI specifications mandated this month for federal network procurements.

The network will support mostly office automation applications. Chief among these is the Correspondence Management System, a vendor-managed service that maintains libraries of text used to reply to constituent letters. Dedicated 56K bit/sec. lines will connect Senate users to the vendor's six Digital Equipment Corp. Decsystem-10 computers in Pittsburgh.

The network will also provide access to information services provided by the Senate and will connect to various vendor database services.

The new network will supplant a "very old data [private branch exchange] system in a star configuration" with 25 leased AT&T circuits multiplexing into state offices, said Shaw Zee, the Senate's data communications manager. Users now have to dial in at 1,200 bit/sec., and when a link goes down, it is likely to stay that way for some time. "We have too many vendors and no central responsibility. Today, if you go to one of the minicomputer vendors and say, 'Your port is down,' the vendor will say, 'No, it's in your network.' Also, we have to rely on user cooperation, and they may not want to talk to us," Zee said.

> "WE'VE GOT 100 senators and 26 committees. Some want to be on the bleeding edge of technology."
>
> ROBERT D. HARRIS
> U.S. SENATE

All data traffic will flow through the DCA switches or PADs, sending status information to a network control center on Capitol Hill. A network management system there will allow Senate and Planning Research technicians to pinpoint problems within minutes, without the need for user involvement, Zee said.

In 1988, the Senate paid $1.8 million to provide data service to 150 offices; today, the same service to 390 offices costs $6 million annually. Zee said the Senate hopes the new network will cost no more in two years than it does now, despite an increase in traffic of 15% to 25% per year.

Harris said the Senate is buying the data communications switches and PADs, and it may move to a private network by replacing Sprintnet with its own 1.5M bit/sec. lines. It may also take over network operations from Planning Research, he said. Harris said the decisions would be based primarily on financial considerations once the new network is operational and traffic statistics become available.

In the meantime, increased bandwidth and reliability will make it as easy for users to do business on the West Coast as on Capitol Hill, Harris said.

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Horwitt

CONTINUED FROM PAGE 43

it. Only IBM can take the whole hog and make it palatable to its own shops in the Fortune 500 sector.

By the whole hog we mean an easily upgradable platform that could act as a combination network file- and disk-server, Netview service point and router/gateway.

It would connect directly to an Ethernet or Token-Ring LAN and then route transmissions across a packet-switched T1 or Integrated Services Digital Network (ISDN) link to other LAN resources or to an IBM host.

The ideal platform would have a low entry price and support IBM's low-end networking, saving OS/2 Extended Edition and AS/400 users from having to route all transmissions via the nearest (or not-so-near) host or front-end processor.

On top of all that, it would support Transmission Control Protocol/Internet Protocol (TCP/IP) and Open Systems Interconnect.

Sound fantastic? IBM doesn't seem to think so. A couple of months back, the vendor furnished a statement of direction which essentially said that all of its Systems Application Architecture lines, as well as the RS/6000, will eventually support both OSI and TCP/IP.

Last week, IBM announced that the AS/400 will support direct Ethernet links, 16M bit/ sec. Token-Ring and TCP/IP terminal-to-host connections.

> ONLY IBM can take the whole hog — an easily upgradable platform that could act as a combination network file- and disk-server, Netview service point and router/gateway — and make it palatable to its own shops in the Fortune 500 sector.

Also introduced was a Teleos server that links to the AS/400 over Token-Ring and lets the host act as a coordinator for telemarketing and service agents who take calls over an ISDN link.

This makes the AS/400 a pretty nifty communications box, especially considering that it already has some really special peer-to-peer Systems Network Architecture (SNA) capabilities as well as an internal adapter that makes LAN connections a snap.

Then there is the ES/9370, which IBM is said to be reintroducing this September at the same time it revamps its 370 line. The 9370, as you may remember, was supposed to be a good communicator, with mysterious, not-quite-SNA peer-to-peer clustering capabilities and an internal front-end processor.

The most recent 9370 model — the 9371 — reportedly improves quite a bit on its predecessor with a built-in Intel 80386 processor and IBM Micro Channel Architecture, which allows it to easily link to LANs as a server/gateway supporting the same protocols as a PS/2, as well as 370-type SNA networks.

And let's not forget the RS/6000, which already has strong TCP/IP networking and network management capabilities and is reportedly being linked up to Netview. IBM definitely plans to provide OSI migration capabilities for the box.

The RS/6000 is also being used as the basis for the proprietary 45M bit/sec. T3 switch that IBM developed for the National Science Foundation Network. Can ISDN be far behind?

To make things truly confusing, there is IBM's cluster controller strategy. The 3174 does SNA now and will do low-entry networking shortly; the 3172 does everything else (TCP/IP, MAP and Ethernet, with OSI to come, no doubt). There are rumors that IBM may hybridize the two, creating yet another promising multipurpose LAN gateway.

A group within IBM is said to be fighting to fit the 3174 as an applications processor so it can act as a file server as well.

So, you say (or more likely IBM would say), what's wrong with a lot of choices? Nothing at all, except IBM's flurry of midrange communications introductions leaves out the 370 mainframes and front-end processors.

Fitting those traditional SNA architectures onto a peer-to-peer, multivendor vehicle is a little like trying to balance an elephant on a bicycle. IBM's OSI Communications Subsystem remains an awkward and expensive interim solution at best.

It's true that IBM's midrange systems are becoming quite effective gateways between SNA hosts and popular networking environments.

This seems like a good interim step to take while waiting for IBM to finish putting together its full peer-to-peer SNA and OSI networking strategies.

The question still remains, however: Which of those platforms is IBM grooming to be its Great Communicator? One? Many? All?

Did you ever have to make up your mind?

Horwitt is a *Computerworld* senior editor, networking.

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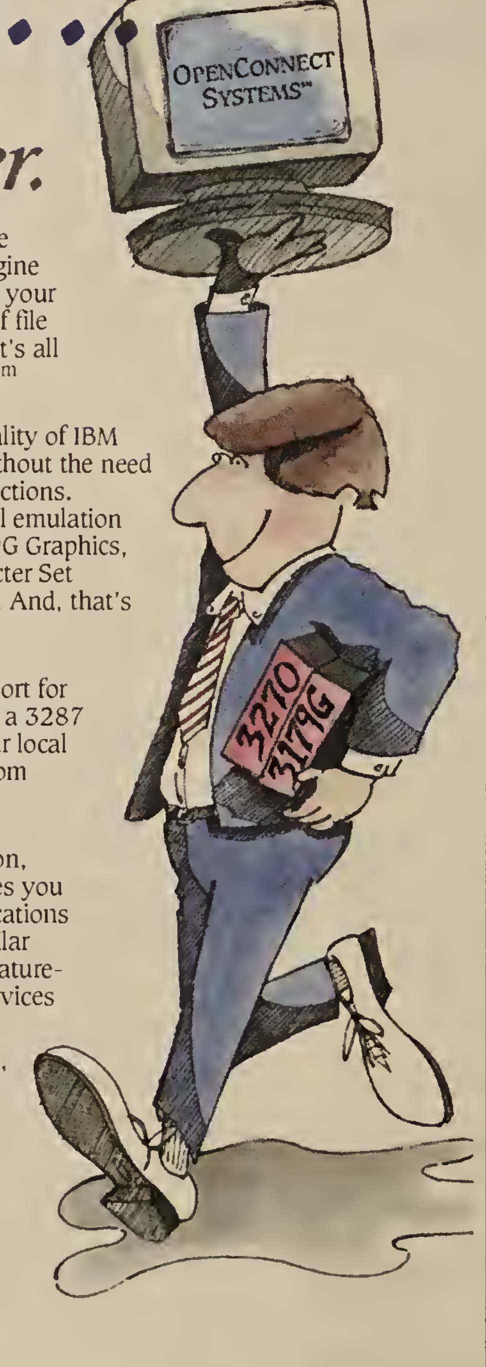

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MANAGER'S JOURNAL

EXECUTIVE TRACK

Steven A. Milston has been promoted to the new position of chief information officer at Minneapolis-based **Health Risk Management, Inc.**, a provider of managed health care services.

Milston will direct the company's information systems research and development and oversee the IS department to support company operations.

Milston was previously director of IS at the firm. His background includes 11 years in finance, five years in manufacturing, 1½ years in consulting and 7½ years in health care.

Before joining Health Risk Management, Milston was a vice-president at First Bank System in Minneapolis. In previous jobs, he was director of a five-year development project for new product support at Control Data Corp. and supervisor of IS operations at the University of Minnesota Hospitals.

……

John D. Christensen has been named manager of IS at the **South Carolina State Ports Authority** in Charleston, S.C.

His responsibilities include supervising operation of Orion, the Port Authority's electronic manifest filing system.

Christensen was previously manager of MIS at the South Carolina Public Service Authority (Santee Cooper). Before that, he was systems and programming manager at Santee Cooper and senior electronic data processing consultant at The Computer Generation, Inc.

……

Who's on the go?

Changing jobs? Promoting an assistant? Your peers want to know who is coming and going, and *Computerworld* wants to help by mentioning any IS job changes in Executive Track. When you have news about staff changes, be sure to drop a note and photo or have your public relations department write to Clinton Wilder, Senior Editor, Management, *Computerworld*, Box 9171, 375 Cochituate Road, Framingham, Mass. 01701-9171.

Daring to alter standard procedures

Martin Marietta's Soucy envisioned a better way to set PC standards, and it worked

BY MITCH BETTS
CW STAFF

In the Army, the guy who complains about the food winds up as the cook. At large defense contractor Martin Marietta Corp., it was a very similar process that put Alan J. Soucy in charge of setting computer product standards for 25,000 end users.

Four years ago, Soucy was in Martin Marietta's Denver aerospace office complaining that some "PC genius" at headquarters was telling him what project management software to use at a time when he was "living and breathing project management software" in the course of his job as chief of project management systems.

Meanwhile, the headquarters staff back East was frustrated because the corporate list of standard products was based mostly on politics, and there was not much compliance with the resulting standards.

Soucy, with typical self-confidence, says he was sure there was a better way to set standards — a way that included getting advice from people doing real work in the field. He was told: "If you think you have a good solution — it doesn't seem to be working the way we're doing it — come on out."

Now the 35-year-old Soucy is manager of computing standards at Martin Marietta, based at the information systems group's headquarters in Chantilly, Va. His sophisticated process for setting standards is getting high marks inside and outside the company.

Soucy's methodology "takes the emotion and biases out. Legitimate business and technical issues get considered, but almost everything else doesn't," says Thomas B. Shafer, vice-president in charge of internal IS at Martin Marietta.

Manuello Paganelli

Martin Marietta's Soucy *is happier about the company's PC standards-setting procedure now that he's in charge of it*

Soucy's Computing Standards Laboratory touts an 11-step methodology for evaluating microcomputer and local-area network products, a process that, not surprisingly, features ample use of field expertise. Standards are no longer based on corporate politics or on the preferences of IBM and Apple Computer, Inc. bigots or on whoever yells the loudest and gets reddest in the face at meetings, Soucy says.

The standards process seems smooth now, but there was considerable resistance to Soucy's overhaul a few years ago, particularly from the IS support managers at the individual Martin Marietta business units.

These local IS managers were apprehensive about Soucy's headquarters operation bypassing them — breaking the proper protocol and talking directly to end users. "The political challenges dwarf any of the technical challenges," Soucy says.

The key to winning converts, Soucy

Continued on page 52

Testing their knowledge of knowledge

Knowledge engineers can become professionally certified by passing the IAKE exam

BY CLINTON WILDER
CW STAFF

The specialists are getting more specialized, and now they're about to become certified, too.

In October, the International Association of Knowledge Engineers (IAKE) will hold the first exam for professional certification in knowledge engineering.

The 2-year-old IAKE, based in Rockville, Md., believes the field has grown significantly enough to warrant a kind of official stamp.

"As the number of knowledge engineers proliferates, employers may be somewhat more skeptical about hiring for specific jobs," said Joseph Coleman, IAKE's director of certification.

"Certification gives the employer some confidence in the applicant over and above the application," he added.

The exam will test technical skills in artificial intelligence, such as know-how in Lisp, Prolog, neural networks and the structures of rule-based and model-based systems.

It will also test applicants in their knowledge of knowledge — cognitive and neuronal science, logic and language theory.

After answering a series of questions, applicants will be asked to construct a simple expert system.

If IAKE membership is any indication, knowledge engineers are indeed proliferating. Membership has jumped from 700 to 1,000 within the past year or so. About 400 members are based outside of the U.S.

Coleman stressed that the certification program is not intended to create an exclusive, haves vs. have-nots situation. "We're not making claims that others can't do this kind of work," he said. "But we wanted some objective or standard for displaying knowledge engineering capabilities."

The exam is scheduled for Oct. 6 in San Francisco. For information, contact IAKE, Suite 302, 11820 Parklawn Drive, Rockville, Md. 20852.

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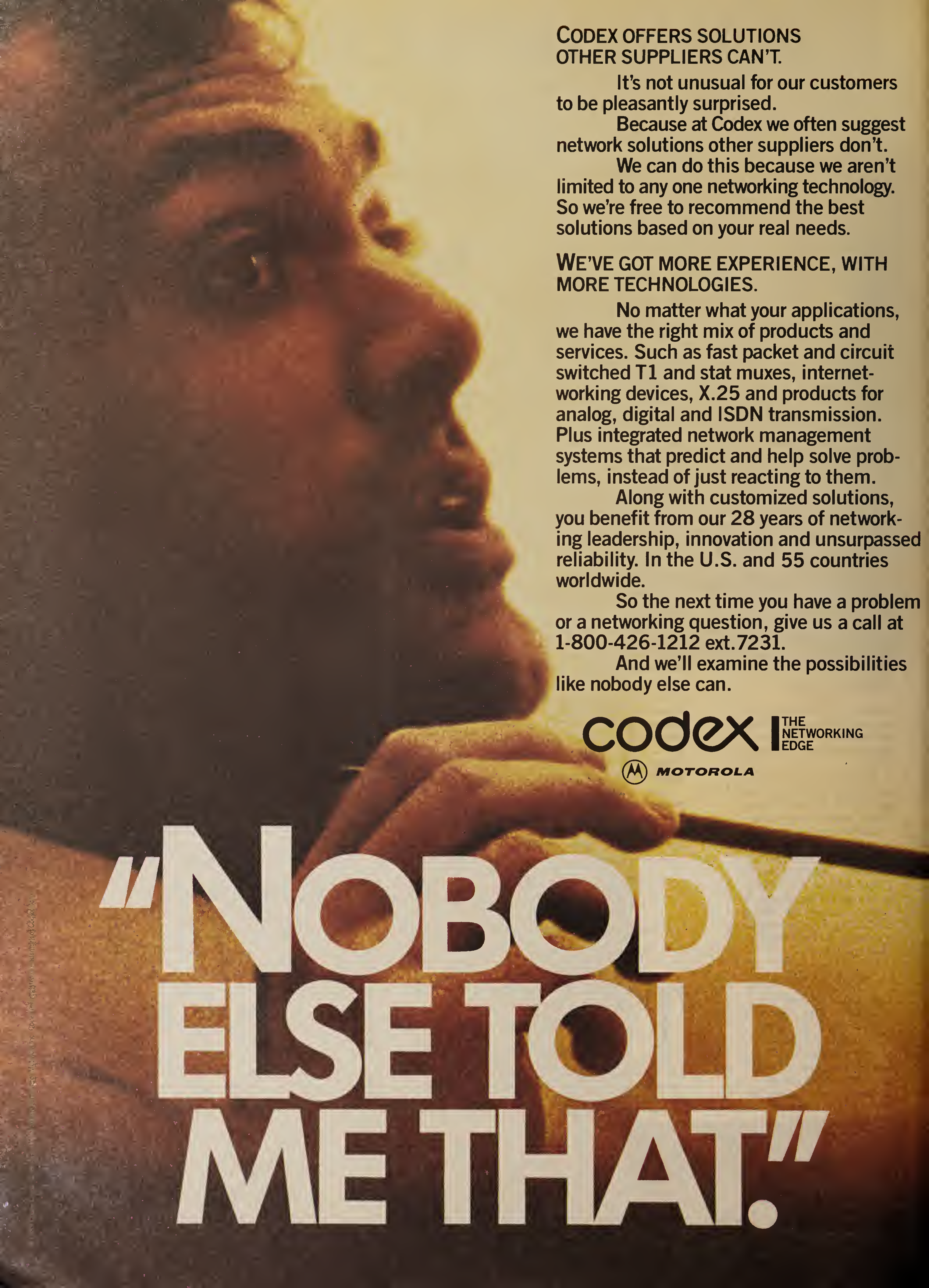
MOTOROLA


"NOBODY ELSE TOLD ME THAT."

BOOK REVIEW

Bit stream of consciousness from a human computer

COMPUTER BIT SLICES FROM A LIFE
By Herb Grosch
Underwood-Miller, Box 1707, Novato, Calif. 94948, $24.95

Computers, as a general rule, do not produce graceful prose; the computer named Herb Grosch is no exception.

Grosch began his career at a time when computers were, by definition, human beings — highly trained scientists and mathematicians capable of performing the backbreaking calculations involved in theoretical and applied research. Although most of his working life has been dedicated to the advancement of the machines that made this fraternity obsolete, Grosch still takes pride in having started out as a member of the elite club of flesh-and-blood computers.

This explains why, when he felt it was time to tell the story of a career that placed him at the scenes of many great moments in early computing, Grosch chose to title his memoir the way he did. Less easy to understand is why the editors at Underwood-Miller did not see fit to explain some of the basic rules of the operating environment to their author. They might, for example, have pointed out that it is one thing to compare your autobiography to a "multidimensional database" and quite another to actually write it like an unpacketized bit stream.

That is not to say that Grosch's structural experimentation is entirely without merit. In carrying out his life-as-a-database theme, he hit upon one very useful idea, which was to provide a list of key words and names at the beginning of each chapter. These are arranged in order of appearance, so it is possible to skip over some of the more impenetrable prose dealing with orbital calculation and optical design and get right to the juicy parts.

These, incidentally, are not sections dealing with Grosch's reportedly prodigious sexual exploits. The excitement comes in the passages that let us peek inside the laboratories and executive offices at IBM and General Electric Co., his two major employers, and eavesdrop on the maneuverings that surrounded the birth and infancy of the computer industry.

Grosch was in the center of the action at many of the industry's most important developmental stages. He served two stints at IBM. The first encompassed the founding of the Watson Lab at Cornell University and the building stages of the firm's ground-breaking 701 mainframe; the second gave him a chance to see Thomas J. Watson Jr.'s operation. Between IBM jobs, Grosch carved out a place for himself at GE during the early days of its ill-fated push to become a force in the computer business.

As manager of one of GE's major IBM sites, Grosch participated in the founding of Share, the earliest IBM user group. Share emerged as a result of extreme frustration among IBM users who were unable to pry loose any detailed information about the company's plans for a follow-on to its popular 701 mainframe.

"We organized to put concerted pressure on IBM, and don't let anybody tell you differently," Grosch writes. "When IBM suavely took it over, they swore it was to trade information around and help newcomers. Hogwash! It was to get Tom Watson and Vin Learson and Cuthbert Hurd to come when we whistled."

Author Herb Grosch

That kind of insider information makes the book valuable, despite its flaws. There are revealing glimpses of the management philosophies at the two companies where Grosch spent most of the years covered. Perhaps most fascinating of all, there are passages that bring home both how very far we have come in a relatively brief period and how little some things have really changed.

Consider what it was like trying to design software in a technical void where even producing copies of documentation was a major feat: "Today's youngsters can't really picture how we worked. Not because of the primitive software tools, not because there was no hardware yet to try prototype programs on, not because nobody had invented terminals — but because there were no copy machines."

Yet, as Grosch communicates quite clearly, many of the issues that those of us in the industry think we are confronting for the first time were here before. In 1956, for example, he was fighting a holding action at GE against department managers who wanted to acquire and control their own computers. As he notes, it was "shades of the Eighties."

In his introduction, Grosch writes of aspiring to "Magic Realism — a picture somewhat larger and clearer than life." In many sections, the effect is something closer to a doctoral thesis dictated by a devotee of *Finnegan's Wake*. Still, some of the bits here are worth retrieving and, if you follow the pointers, the search procedure will execute fairly rapidly.

JOANNE KELLEHER

Kelleher is a *Computerworld* features editor.

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Standards

FROM PAGE 49

maintains, has been establishing the credibility of the standards-setting process.

The rigorous product-evaluation process, which takes approximately two to six months, begins by having a technical advisory council set priorities on what technologies to evaluate and identify the field experts in those technologies. Then, and perhaps most importantly, the field experts identify the mandatory and optional features they need to do the job.

The lab staff weeds out all of the products that fail to meet the mandatory requirements and sends the top contenders out to the field offices for a lengthy, hands-on evaluation by the experts.

The users' scoring sheets are tallied up in a matrix that looks like a chart from *Consumer Reports* magazine, and a winner emerges.

Figuring that the lab's structured decision-making process could be applied to other technologies, there is even talk of expanding its scope to include engineering workstations and programming tools.

Shafer considers the program to be highly successful, noting that the standards have a compliance rate of at least 80% and that the process has gradually gained the respect and involvement of all business units at the firm.

A more tangible result is that Soucy's unit has landed Martin Marietta some whopping volume discounts.

Because of the corporate-wide standards, Martin Marietta can negotiate volume discounts that produce savings of $4 million to $10 million each year — several times the lab's budget of $1 million, according to Soucy.

Bottom-line results like that will keep the standards lab in business at a time when defense industry budgets are being slashed. "In a tight budget climate, the kinds of discounts and disciplines we're talking about become even more important," Shafer says.

Martin Marietta's clout with vendors goes beyond discounts. When Soucy makes a suggestion for improving a product, vendors listen.

Zenith Data Systems, for example, followed Soucy's recommendation to install Microsoft Corp.'s Windows 3.0 on the hard disks of its Intel Corp. 80386SX-based microcomputers at the Zenith factory, saving Martin Marietta technicians lots of time when they set up the micros

Behind closed doors

One way that Alan Soucy, manager of computing standards at Martin Marietta, has increased the company's clout with vendors is through membership on customer advisory councils.

The user councils typically provide feedback to the vendors on product strategies and features. Soucy is a member of advisory councils associated with Apple Computer, Inc., Aldus Corp., Novell, Inc. and Zenith Data Systems, for example.

However, Soucy is most proud of his role as founder and vice-president of Managing Apple Computers in Information Systems, an independent organization in Chicago. It has an exclusive membership of IS managers in organizations with at least 100 Macintoshes.

"The roster is Apple's crown jewels . . . and they have big-time clout," Soucy reports.

The group holds a conference every six months featuring closed-door sessions in which Apple discloses its product plans and the IS managers provide Apple with a consolidated list of users' recommendations.

MITCH BETTS

In 1863,
S. Langhorne
Clemens
decided to change
his name.

for thousands of users. Ditto for those thumb screws on the back of the Zenith personal computer.

Soucy emphasizes that there is much more to his operation than coming up with a standard product list. "Even after selecting a standard, most of the work is ahead of you. Some companies fall short because they make this great decision and don't know what to do next."

At the Computing Standards Lab, the follow-up includes getting the word out to executives and thousands of employees through in-house newsletters, planning training courses and technical support, obtaining spare parts for the in-house repair technicians and preparing hot line support. "Otherwise, the standard just dies," Soucy says.

Within Martin Marietta, "we don't have any clout other than our reputation" for credible standards, Soucy says. "Anybody in this company can buy whatever they want at any given time if they have the right justification. There is no standards police that runs around the company handing out fines or putting you in the penalty box," he adds.

Soucy is striving for an approach that is somewhere between standards-by-committee and standards-from-headquarters — or perhaps a blend of the two. "We've got a vision of where we're going to go and why, but it's the people in the field who shape that and fine-tune it based on their field requirements and expertise," he explains.

In other words, it's a textbook case of participative management.

Soucy sums up his management philosophy this way: "No individual organization within the company has all the answers, but the answers can be arrived at if we get the right people involved."

> "THE POLITICAL challenges dwarf any of the technical challenges."
>
> ALAN J. SOUCY
> MARTIN MARIETTA

MANAGEMENT BRIEFS

New duties for CIO

Michael R. Zucchini, executive vice-president and chief information officer at **Fleet/Norstar Financial Group, Inc.** in Providence, R.I., was given two new management responsibilities in a recent reorganization.

In addition to managing Fleet/Norstar's data processing and bank operations activities, Zucchini was given the responsibility for AFSA Data Corp., the firm's student loan processing subsidiary based in California.

He was also made responsible for the corporate products and services group, which develops and markets products and services for all Fleet/Norstar subsidiaries.

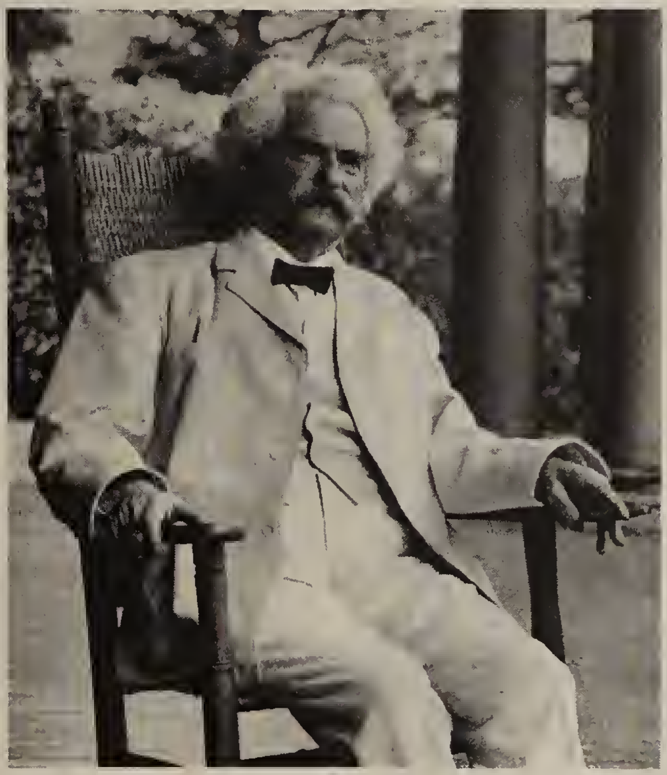
Wendy P. Shade, manager of customer support at Iron Mountain Records Management Co. in Los Angeles, became president of the **Association of Records Managers and Administrators** (ARMA International) for a one-year term beginning July 1.

ARMA International, based in Prairie Village, Kan., is an association of records and information management professionals with more than 10,600 members in the U.S. and Canada.

John Elliott, former director of information systems for the city of Seattle, has joined Seattle-based **R. W. Beck and Associates** to lead its IS consulting practice in the western U.S.

Before joining the city of Seattle, Elliott managed systems development at the city of Los Angeles Department of Water and Power. His most recent position was as a senior manager at Ernst & Young's consulting division.

It worked for him.



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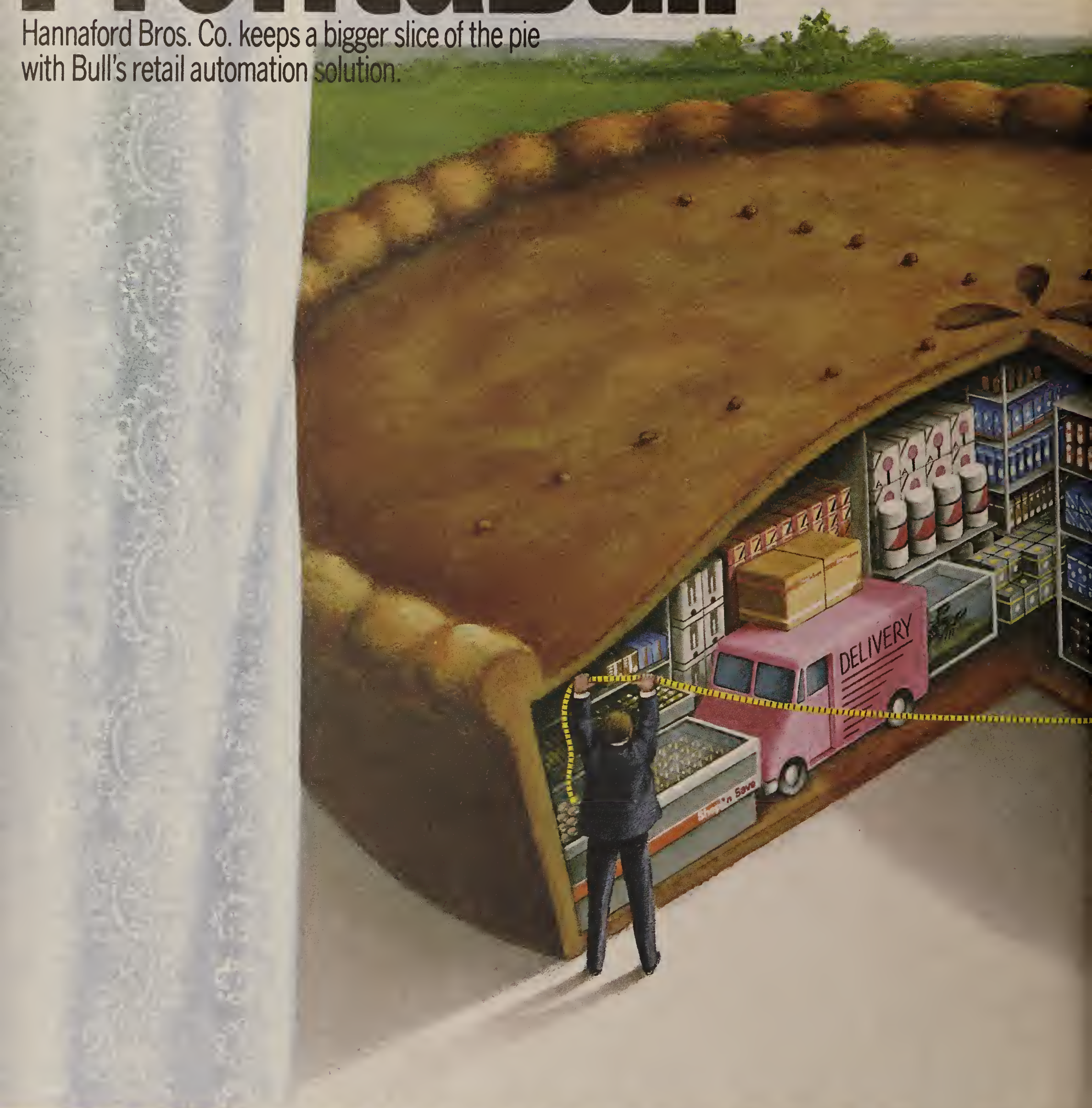

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Know Bull.

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  - 100 Family
  - 200 Family
  - 300 Family

Retail Applications

- Direct Store Delivery
- Point-of-Sale Support
- Time and Attendance
- Labor Scheduling
- Perishable Scale Support
- Video Tape Management
- Photo Processing
- COMPASS Pharmacy
- Third-party Claims Verification
- Message Mail
- PhoneFind In-store Product Locator

Support

- 24-hour hardware maintenance and support
- Application Help Desk Support
- Implementation Planning

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One Solution.

Worldwide
Information
Systems

Bull

CALENDAR

The CIO Information Industry Conference, "Information Strategies for the '90s, Thriving on Change," is scheduled for Oct. 28-30 in Palm Springs, Calif.

The conference, sponsored by CIO Magazine and AMR International, will emphasize chief executive officer information imperatives, outsourcing strategies, motivating for innovation, security and privacy trends, imaging systems and more.

For more information, contact Lori Cardarelli, CIO Magazine, Framingham, Mass. (508) 872-8200.

SEPT. 23-29

Networking/Unix '90. Atlanta, Sept. 24-25 — Contact: Sue Fredricks, Inforum, Atlanta, Ga. (404) 220-2711.

The Expanding Glass House of the '90s. Toronto, Ont., Sept. 24-26 — Contact: Meta Group, Westport, Conn. (203) 226-6382.

PC Expo. Chicago, Sept. 25-27 — Contact: H.A. Bruno, Inc., Englewood Cliffs, N.J. (201) 569-8542.

SAA World Conference & Exposition. Los Angeles, Sept. 25-27 — Contact: Digital Consulting, Andover, Mass. (508) 470-3880.

The Intelligent Corporation Conference. New York, Sept. 26 — Contact: The Ruth Stanat Forum, New York, N.Y. (212) 725-4550.

Managing the Global Forces of Change: Strategies for Corporate Success in the '90s. Fort Collins, Colo., Sept. 27 — Contact: National Technology University, Fort Collins, Colo. (303) 484-0565.

Portable Computing and Communications Exposition and Conference. New York, Sept. 27 — Contact: Michael Sullivan, IDG Conference Management Group, Framingham, Mass. (800) 225-4698.

Operations Manager Conference. Laconia, N.H., Sept. 27-28 — Contact: Jerry Lemelin, Portsmouth, N.H. (207) 438-2491.

SEPT. 30 - OCT. 6

Benefitting from Systems Integration. New York, Sept. 30-Oct. 2 — Contact: Abbey Chakalis, CMP Conference Group, Manhasset, N.Y. (516) 562-5717.

Ventura Publishing Seminar. San Jose, Calif., Sept. 30-Oct. 2 — Contact: Bob Moody, VPUG (408) 227-5030.

Development Center Institute Fall Conference. Indianapolis, Sept. 30-Oct. 3 — Contact: Development Center, Indianapolis, Ind. (317) 846-2753.

Information Industry Association's Annual Convention & Exhibition. Boston, Sept. 30-Oct. 3 — Contact: IIA, Washington, D.C. (202) 639-8262.

Control, Audit and Security Conference. Atlanta, Sept. 30-Oct. 4 — Contact: Patsy Day, MIS Training Institute, Framingham, Mass. (508) 879-7999.

TCP/IP Protocol Suite. Burlington, Mass., Oct. 1-2 — Contact: State-of-the-Art Program, Northeastern University, Dedham, Mass. (617) 320-8055.

AS/400 Technical Conference. Hilton Head Island, S.C., Oct. 1-3 — Contact: AS/400 Technical Conference, Warrenville, S.C. (800) 552-9404.

Effective Methods for Information System Quality Assurance. Orlando, Fla., Oct. 1-3 — Contact: Quality Assurance Institute, Orlando, Fla. (407) 363-1111.

Information Industry Scenario Conference. Phoenix, Oct. 1-3 — Contact: Ashley Pearce, Gartner Group, Stamford, Conn. (203) 964-0096.

Information Technology Conference & Exposition. San Diego, Oct. 1-3 — Contact: Data Processing Management Association, Park Ridge, Ill. (708) 825-8124.

National Computer Security Conference. Washington, D.C., Oct. 1-4 — Contact: Tammy Grice, National Institute of Standards and Technology, Baltimore, Md. (301) 975-2775.

Scan Tech '90. Atlanta, Oct. 1-4 — Contact: Aim USA, Pittsburgh, Pa. (412) 963-8588.

CD-ROM Expo. Boston, Oct. 1-5 — Contact: Dorothy Ferriter, IDC, Framingham, Mass. (800) 225-4698.

Object-Oriented Systems Development. Washington, D.C., Oct. 1-5 — Contact: Barnett Data Systems, Rockville, Md. (301) 762-1288.

Unix Solutions Exposition and Conference. Anaheim, Calif., Oct. 3-5 — Contact: The Interface Group, Needham, Mass. (617) 449-6600.

Accessible Computer Technology Exhibit. Washington, D.C., Oct. 4 — Contact: Alan Douglas, ACT 111, Washington, D.C. (703) 557-6159.

OCT. 7-13

Pacific Northwest Software Quality Conference. Portland, Ore., Oct. 7-9 — Contact: Terri Moore, Pacific Agenda, Portland, Ore. (503) 223-8633.

Fox Developer Conference. Toledo, Ohio, Oct. 7-10 — Contact: Fox Software, Perrysburg, Ohio (419) 874-0162.

Indycon Electronic Show & Conference. Indianapolis, Ind., Oct. 8-9 — Contact: Indycon, Carmel, Ind. (317) 571-8462.

Eastern Exposition and Conference. Alexandria, Va., Oct. 8-10 — Contact: The American Public Communications Council of the North American Telecommunications Association, Washington, D.C. (800) 538-6282.

National Communications Forum. Chicago, Oct. 8-10 — Contact: National Communications Forum, Chicago, Ill. (312) 938-3500.

Southeastern Telecommunications Association Conference and Equipment Exposition. Miami Beach, Fla., Oct. 8-10 — Contact: SETA, Columbia, S.C. (803) 731-5640.

American Production and Inventory Control Society International Conference and Exposition. New Orleans, Oct. 8-12 — Contact: APICS, Falls Church, Va. (703) 237-8585.

Interop '90. San Jose, Calif., Oct. 8-12 — Contact: Interop, Inc., Mountain View, Calif. (415) 941-3399 ext. 200.

CASE World Conference and Exposition. Chicago, Oct. 9-11 — Contact: Digital Consulting Group, Andover, Mass. (508) 470-3880.

Northcon/90. Seattle, Oct. 9-11 — Contact: Northcon, Los Angeles, Calif. (213) 641-5117.

Executive Information Systems in Government. Washington, Oct. 9-12 — Contact: Conference Manager, USPDI, Inc., Silver Spring, Md. (301) 445-4400.

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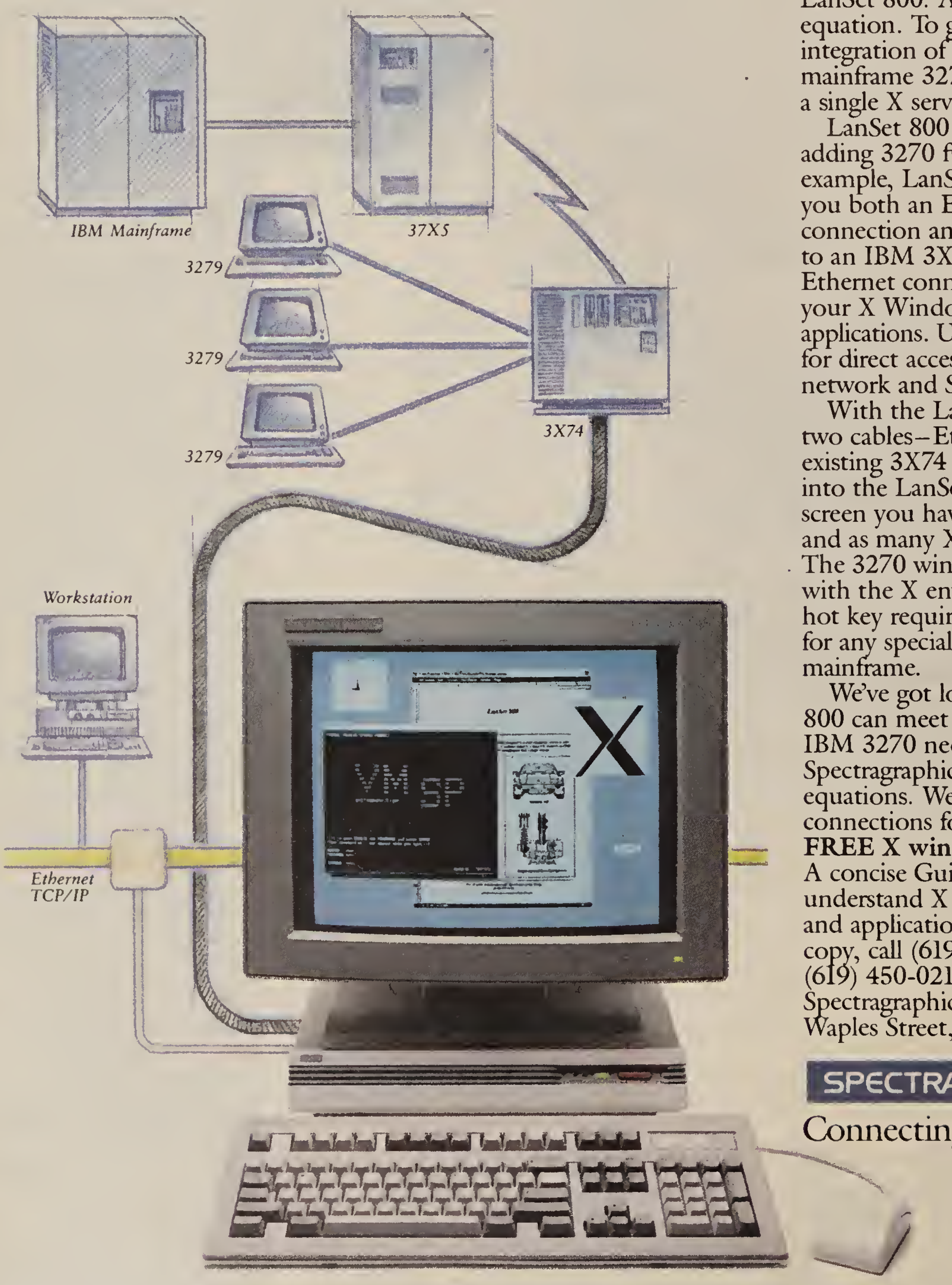

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PRODUCT SPOTLIGHT

DATA CENTER AUTOMATION

Consolidation promotes hands-off strategy

BY MICHAEL FEUCHE

When Merrill Lynch & Co. set out to consolidate its seven data centers in the U.S., UK and Canada, it created a two-phase plan. In phase 1, the company would physically relocate all of its diverse operations to two large centers in New York; in phase 2, it would configure automation tools to meet the new needs of the larger centers.

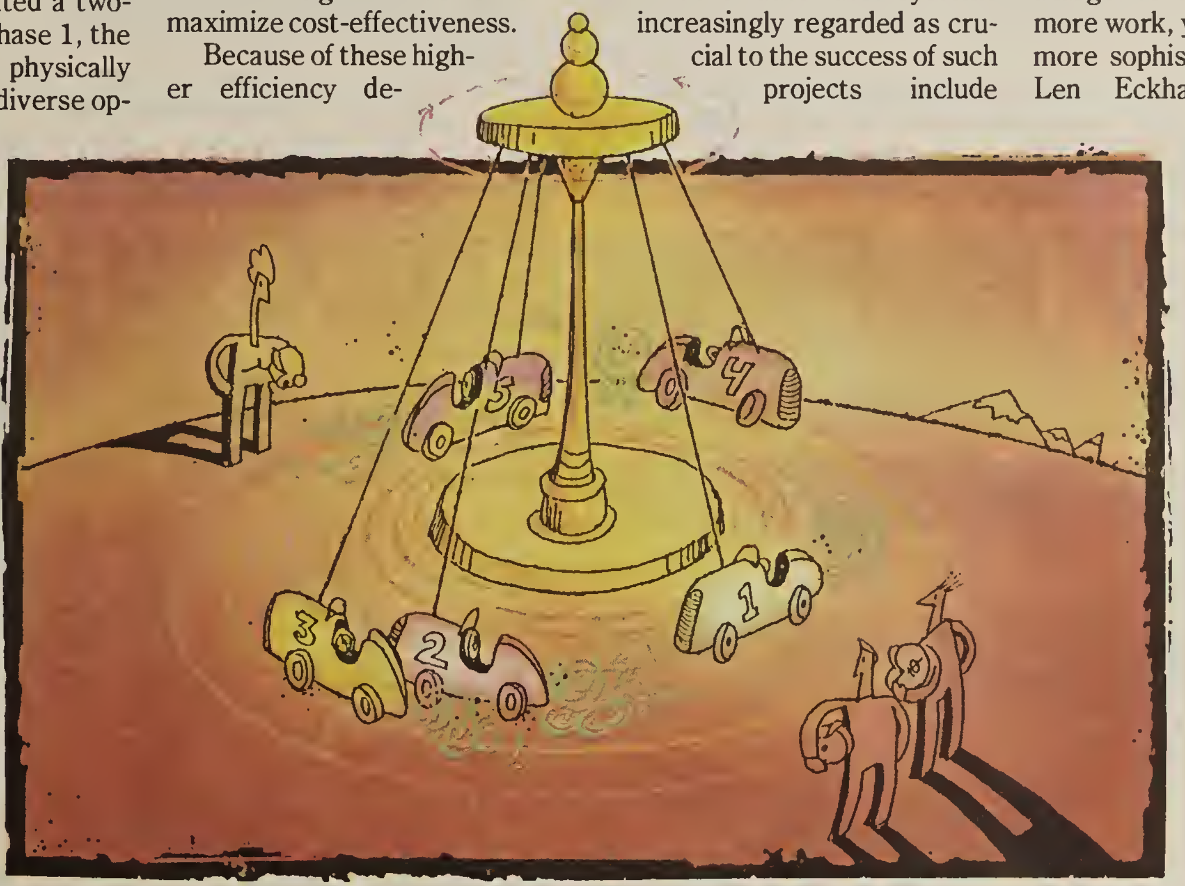
During the physical relocation stage, the brokerage firm discarded half of its 13 mainframes, which processed 536 million instructions per second (MIPS) in three countries, keeping only seven machines to process 734 MIPS.

The new Merrill Lynch data centers process in one day almost four times the number of batch jobs that a "typical" data center runs, according to statistics from Arnold Farber, president of Farber/LaChance. They also process six million on-line transactions per day.

Howard P. Sorgen, first vice-president of operations, systems and telecommunications and the leader of Merrill Lynch's consolidation project, says automation tools were crucial in helping him gain control over the amount of processing taking place in the new data centers. "Consolidation means automation," he says.

That maxim doesn't apply only to Merrill Lynch. When data center operations are consolidated into a single supercenter, work loads inevitably increase as staffs of the same size or smaller are asked to cope with increased processing traffic, including that from "satellite centers" monitored remotely from the supercenter.

Supercenters also typically operate within tight processing schedules, running 24 hours a day, seven days a week with drumhead-tight windows to maximize cost-effectiveness.



David Povilaitis

Because of these higher efficiency demands, many companies seeking economy of scale through data center consolidation are starting to see automation tools as a virtual necessity.

"Without these tools, I don't know how we could handle our work load and network size, says Robert Drum, executive vice-president at the Fleet/Norstar Financial Group, Inc. The banking institution has consolidated 11 data centers into one, saving $10 million in hardware, software and staff reductions.

The products Drum finds most useful in expediting day-to-day operations are tape management, restart and job scheduling systems. "If I did not have them," he says, "the staff levels I would need to do the same things manually would be quite inflated."

Other automated systems increasingly regarded as crucial to the success of such projects include console automation tools — both to reduce staff and manage remote operations — and job scheduling and balancing tools to keep processing as efficient as possible.

With consolidations on the rise, these tools will only grow in demand. According to Jeff Schulman, a vice-president at Gartner Group, Inc., a research firm in Stamford, Conn., more than 30% of the firm's customers have already centralized their operations. He says he expects that figure to grow to 60% by 1992.

"Consolidation is growing in tandem with automated systems operation," Schulman says. "The two really go hand in hand."

"If you take two small data centers and make them into a larger center trying to produce more work, you're going to need more sophisticated tools," says Len Eckhaus, president of the Association for Computer Operations Management. "This is going to add to the purchase of automation tools."

Console automation systems are on the top of many data center managers' lists when they perform a consolidation. Out of 431 IBM 3090 sites surveyed by software vendor Candle Corp., roughly 45% of those that had purchased or planned to purchase a console automation tool had consolidation as their goal.

The first console automation application in nearly every shop is the reduction of routine IBM MVS operating system messages that flash by operators' console screens.

"If a data center goes from running 200 jobs to 400 jobs per day, these tools become critical," Eckhaus says. "Operators can't respond to all the messages generated from a regular work load; now those work loads are doubling."

At Merrill Lynch, reducing messages "was our first need," says Leonard Peters, assistant vice-president of operations, systems and telecommunications. "We were able to decrease the number of unsolicited messages going into the operator's console by 85% using IBM MPF software."

Console automation tools also create a single point of control to integrate the functions of other automation tools.

"When we [consolidated into]

Continued on page 60

Feuche is a free-lance writer based in New York.

INSIDE

Aiding the Samaritan
Help desk staff get new capabilities from old tools. Page 68.

The Second Step?
How important is it to integrate your automation tools? Page 65.

Product Chart
A comprehensive listing of console automation software. Page 69.

> "WITHOUT THESE tools, I don't know how we could handle our work load and network size. The staff levels I would need to do the same things manually would be quite inflated."
>
> ROBERT DRUM
> FLEET/NORSTAR

Continued from page 59

two data centers," Sorgen says, "we brought together multiple systems, which required intervention by operators at multiple consoles. Now, there is a single console for an entire data center."

These systems are also needed to control operations remotely. When Manufacturers Hanover Trust Co. consolidated two mainframe installations in 1989, it planned to run one as a satellite center controlled through remote operations at the main data center, according to Howard S. Taylor, assistant vice-president at the firm. The firm already had some automation software, but it needed to purchase a console automation tool to control operations remotely. The resulting staff reductions have saved the company $4.5 million in the past two years, Taylor says.

The company also plans to use its remote capabilities for disaster recovery. "During interruptions of service, remote console operations will permit us to use either one as a contingency site," says Michael Pasiecki, senior vice-president of wholesale computing services at the firm.

At MCI Communications Corp., an OPS/MVS console automation system from Goal Systems International, Inc. will run all three Supernode computer centers now being created in Ohio, California and Oklahoma, says Alan Ditchfield, vice-president of systems engineering at MCI.

Distinctive traits

Efficient data centers support greater work loads with fewer people and tend to spend more on technology

	Characteristics of	
	the efficient data center:	**the average data center:**
Approximate MIPS:	160	75
Disk storage:	400G	282G
Number of people managing disk storage:	4	3
Number of gigabytes managed by each person:	100G	94G
Response time for end users during peak hours:	3.5 seconds	4 seconds
Number of users concurrently using on-line systems during peak hours:	2,500	1,500
Pages of paper produced each month:	5.4 million	6.4 million
Number of people in the print pool:	6	9
Percent of staff's time dedicated to distributing printed output:	33%	40%
Number of people on staff:	109*	94*
Percentage dedicated to clerical and administrative management and planning:	22%	20%
Percentage dedicated to direct operations:	30%	40%
Percentage dedicated to operations support:	29%	25%
Percentage dedicated to technical services:	19%	15%
Percentage of people dedicated to manual-intensive tasks:	30%	40%
Salary:	$45,000	$40,000

*Nolan Norton notes that in the efficient data center, it took about half the personnel to support the same amount of work as in the average data center. A personnel profile showed that the efficient data center emphasized reducing manual-intensive activities.

Source: Nolan Norton Institute

CW Chart: Paul Mock

The system provides a single point of remote control from a central location in Arlington, Va., for MCI's Omegamon performance monitoring software from Candle and its CA-7 and CA-11 job scheduling and recovery systems from Computer Associates International, Inc.

While most console automation tools are mainframe based, several are also available in personal computer-based versions, such as Automate/PC and CA-Opera/PC. These are designed in particular to perform on-site automated control of largely unattended remote centers.

Right on schedule

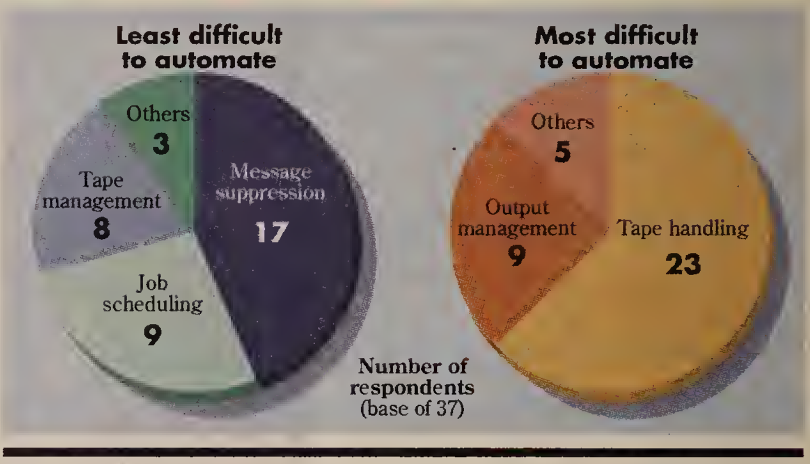
A more traditional tool that is seeing new demand from supercenters is job scheduling software, which first appeared in the 1970s. These tools are used in approximately 30% of large mainframe installations, according to Computer Intelligence, with CA's CA-Scheduler holding 78% of the installed base. With the increasing number of jobs that need to be run efficiently in consolidated data centers, these tools are coming into demand.

"We could not function without a scheduler to help us process 5,000 batch jobs a day," says Bill Pollard, senior technical consultant at Baxter Healthcare Corp. in McGaw Park, Ill. The firm completed consolidating its mainframe facilities in 1987.

Job scheduling systems apply logic dynamically in order to determine event- or time-driven schedules to run jobs for optimum throughput and the most efficient use of data center resources.

Easy road, hard road

Data center and operations managers say tape mounting is one of the most difficult processes to automate, while another storage management task, tape management, is one of the easiest



Source: Ernst & Young

CW Chart: Paul Mock

Schedulers, Pollard notes, have become increasingly sophisticated over the years. For instance, they can support a greater number of jobs and work well with report distribution systems.

Job scheduling systems vary according to the daily number of jobs they support.

The CA-7 scheduler can cost from $35,000 for an IBM 4380 package supporting 30,000 jobs per day to $105,000 for a 3090 version addressing as many as 80,000 jobs per day.

Gaining balance

Another tool that helps supercenters run jobs efficiently is job balancing software. This software scrutinizes computer runs to determine whether the right application is reading the correct information for a particular job.

Balancing systems also perform functions that are otherwise done manually by the production control department. These include verifying control values and totals and performing balancing calculations and comparisons, which are needed in accounting applications.

According to Eckhaus, these systems are just now coming into vogue. Their newfound popularity, he says, can be attributed to the increased emphasis on automation in general and the larger operations needs found in the merging of data centers. "While two smaller data centers could handle balancing manually," he says, "job balancing systems relieve the production control department of that responsibility."

While other vendors are entering the fray, the two major companies offering job balancing products are Beta Software Systems, Inc. in Concord, Calif., and Unitech Systems, Inc.

While chances are small that a firm would have balancing software upon consolidation, many installations have some automation software when they consolidate. The first problem these companies face is which automation tools to keep, which to discard and which to augment.

Existing systems are a mixed blessing to most organizations, especially when the consolidation involves two data centers with firmly established information systems capabilities.

At Fleet/Norstar, Drum says both the Fleet and the Norstar data centers had already gone through eight years of consolidating the facilities of banks previously acquired. "We had a lot of the things we needed and did not have to go out and acquire a lot of software," he says. For instance, both data centers used the CA-7 job scheduling system.

Elsewhere, Drum recalls, "We had to look at each tool and at its capabilities and maintenance costs."

Merrill Lynch was faced with several different suites of automated tools. It standardized on IBM for console automation because it already used Netview to manage the network and automate consoles. Its other IBM systems include Info/Mgt for problem management, Message Processing Facility, OPC/A for job scheduling and the TPNS testing facility.

Existing software may not always work when two data centers merge. In the consolidation of two data centers at the USS Steel division of USX Corp., the unique coding of proprietary software posed problems when it came time to integrate systems. The company is now in the midst of replacing the homegrown tools with commercial ones.

Some problems associated with consolidation currently cannot be solved by automation tools. Tape mounting and printing functions fall into this troublesome category when central operations groups are given the job of running satellite centers.

While robotic tape backup systems can mount tapes without human intervention, they cannot move the tapes off-site, nor can every satellite center afford to store all data on these systems.

However, hardware approaches are emerging that can at least partially clear

Continued on page 64

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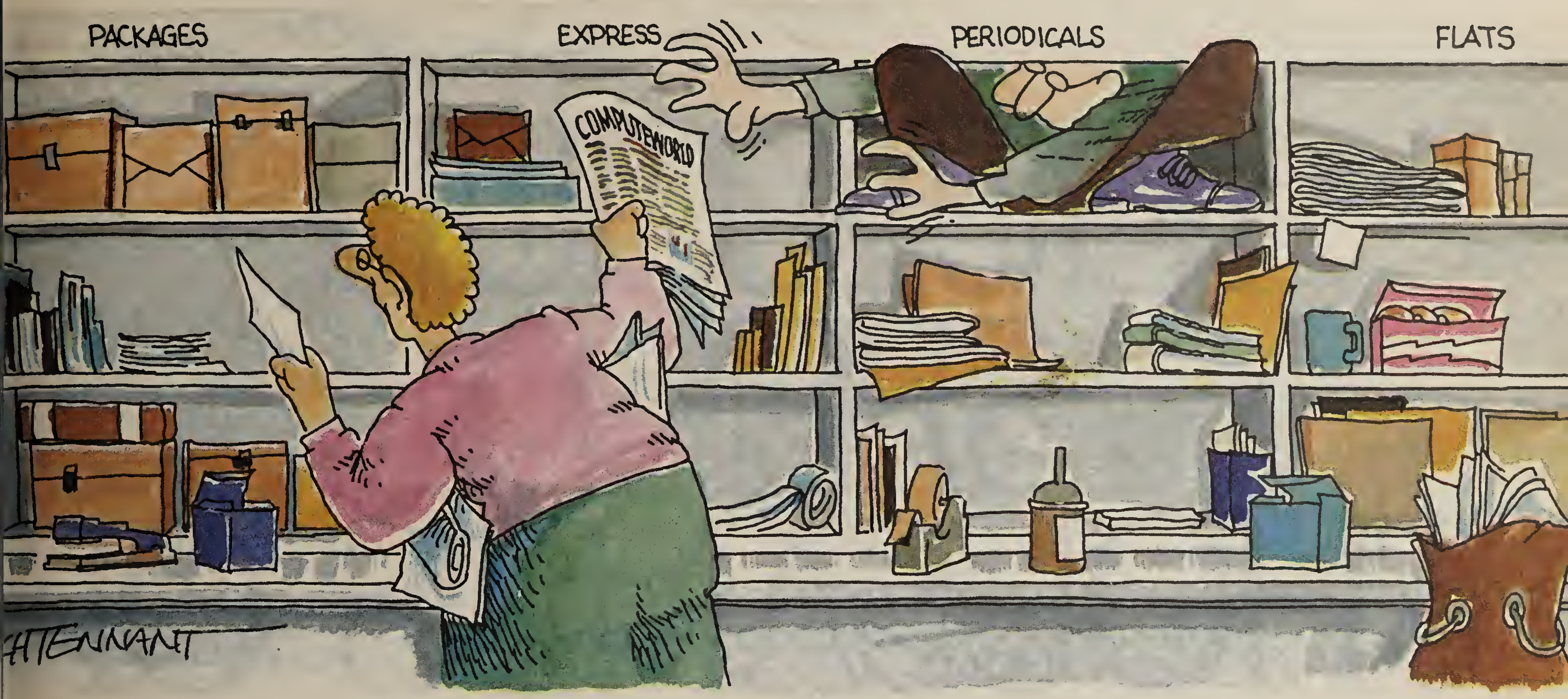

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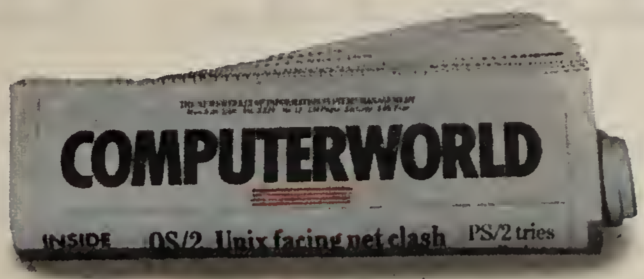

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ASK THE VENDOR

We use VSAM I/O Plus for automated VSAM performance tuning. We would like the system to be able to address buffers above the 16M-byte line. Do you have any such enhancements planned?

Larry Tyrell
Senior Technical Analyst
Jefferson-Pilot Life Insurance Co.
Greensboro, N.C.

SOFTWORKS, INC.: Version 4 of VSAM I/O Plus allows the user to set up a 31-bit buffering as the default, thus taking advantage of available space above the 16M-byte line. Without user intervention, VSAM I/O Plus can determine whether the calling program is running in 24-bit mode and will present the record to the program below the buffer line, if required. VSAM I/O Plus will also automatically adjust data and index buffers and increase region size as required for buffers.

Most automated tape management systems require operating system modifications. If we use Epic/VSE for tape and disk management, will we be required to modify our operating system, which is Supervisor?

Rob Cron
Manager of Technical Support
Restaurant Enterprise Group, Inc.
Irvine, Calif.

GOAL SYSTEMS INTERNATIONAL, INC.: Activation of Epic/VSE requires specific modules to be loaded into the Shared Virtual Area. All of these modules will have an entry in the System Directory List, which the operating system uses for the fast loading of frequently used programs. When the Epic/VSE system is activated, the System Directory List entries for certain modules are swapped so that Epic/VSE modules will be given control prior to the corresponding operating system module. Epic/VSE is therefore able to gain control of a request, process it and then pass it to the operating system for processing.

This method of gaining control is in effect only until an IPL or the Epic/VSE system is deactivated. This access method insulates Epic/VSE from operating system changes and allows users to make changes to the system without IPL.

Continued from page 60

staffers from data center floors.

Some firms are looking into electronic vaulting to perform backup duties. Through telecommunications lines, data stored at one site can be transmitted electronically to another.

One problem with this method is its high cost. A typical configuration can range from $500 to $750,000.

Manufacturers Hanover is considering installing an electronic vaulting system as part of its next consolidation phase in early 1991 when it will move one of its New York centers to Delaware.

"WHEN WE [consolidated into] two data centers, we brought together multiple systems, which required operators at multiple consoles. Now, there is a single console for an entire data center."

HOWARD P. SORGEN
MERRILL LYNCH

Taylor says the cost will be more than made up for by reductions in the cost of human operations and human errors.

In general, the larger data center formed by consolidation has an easier time cost-justifying the purchase of automation tools. "Expense is much more justifiable in a large shop," Eckhaus says. "Most automation tools are really geared toward the larger data center."

In the face of outsourcing and budget cuts, all data centers need to focus on maximizing cost-effectiveness. When consolidation is the first step, automation is often an effective follow-through. ●

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INTERVIEW

Are you ready for your tools to talk?

Peat Marwick's Mark Levin says tool integration is the way to get full functionality from your automation purchases and can also become your ticket to lights-out operations

Buying an automation tool is just the first step. The next is to integrate, says Mark Levin, head of KPMG Peat Marwick Main & Co.'s Data Center Transformation practice in Lexington, Mass.

You can reduce manual intervention by automating individual functions but to get full use of these tools and especially to achieve unattended operations, Levin says, you need interfaces.

In a recent conversation with New Jersey-based free-lance writer Barbara Francett, Levin spoke about the benefits of integrating your automation tools but emphasized that not everyone is ready for it.

Q: What exactly do you mean by "full integration?"

A: You can reduce staff by automating individual functions with robotic tape mounting, electronic output distribution, console automation and other control software, but there is still a time inefficiency. You still need manual intervention to communicate among the various functions.

To restart a job, for example, you'd need to set up the JCL [job control language] files, document the problems, and call a maintenance programmer. That could take more than 20 minutes.

If you had interfaces built in, the communications would be performed electronically. You would need only one person to monitor the console for anomalies, and you would reduce wait time.

Q: It sounds like full integration is synonomous with lights-out operations.

A: Without full integration, you won't get to lights-out operations.

Q: So integration is not for everyone?

A: Most data centers are just at the point of automating individual functions and are about two years away from getting products to communicate with one another.

There's a good reason for this: If I install an output distribution product, I could reduce the printing pool from 10 staff members to seven. If I put major reports on-line for viewing, I could reduce that by another three or four people. By installing an interface between output distribution and console management, I'll eliminate maybe half a person.

Most data center managers will go for the larger payback first.

Q: With that kind of staff reduction, integration may not be worth the trouble to some data centers.

A: You may not be seeing the same payback in terms of staff reduction, but you're making operations more efficient. If a data center manager can deliver reports 100% on time rather than 95% on time, he's going to do it.

Q: So who is ready to start integrating?

A: Highly automated data center environments are ready to maximize their investment in the software and hardware, which is the real reason to integrate tools. They're ready to start thinking lights-out, whether it's just on holidays, weekends or the third shift.

Q: How many companies that you know of have reached full integration?

A: I haven't seen anybody do it yet.

Q: What areas of data center operations are companies most interested in interfacing?

A: The most frequent request is for an interface between problem/change management and software configuration management to maintain overall control over changes made to software configurations.

The second most requested interface is between automated scheduling/restart and automated output distribution. The restart package would delete reports that have been previously archived by the job being restarted.

The third most popular is between console management and problem/change management, to report all production failures and automatically open the problem record.

The fourth is between automated output distribution and data center reporting, for chargeback purposes and to track project results.

Q: What do you consider the absolute minimum level of integration necessary?

A: I'd strongly recommend integrating the automated scheduling and restart/rerun functions. The amount of work required to restart a job in an MVS environment is excessive. Most vendors provide an interface between these functions.

Q: Where is the state of vendor-to-vendor integration?

A: I haven't seen too much of it. Legent has a standard interface between its Endevor software configuration management product and Infoman, IBM's problem/change management product. Candle's Omegamon performance monitor can interface with MVS/OPS and Legent's Automate — both of which are console managers.

Basically, all automation software has the potential for interfaces to other vendors' products through "user exits." These exits are tailorable based on user needs. It's a matter of exploiting them.

Q: And how difficult is it to exploit them?

A: Some interfaces are easier to establish than others. Some vendors are providing the routines to build interfaces, such as a standard code for the interface from console management to problem/change management.

Q: How sophisticated are the vendor-to-vendor interfaces offered?

A: It varies. Sophistication is determined by how much functionality is manual and how much is automated.

Between a restart/rerun package and an output distribution product, for instance, a basic interface will identify redundant jobs and tell the output distribution package to delete those reports. A sophisticated interface would go out and handle the purging.

Q: Some vendors are offering fully integrated packages that offer integration within a line of automated data center products. To what degree do they offer full automation?

A: Computer Associates is tops in MVS-based products. Goal Systems has been working on interfaces among its products. Its scheduler, Jobtrac, interfaces to the restart/rerun product Runtrac. They are working on interfaces between Runtrac and the SAR/Express Delivery output distribution package and between Jobtrac and the MVS/OPS console manager.

Legent's Endevor software configuration product — another strong product — interfaces to its MICS data center reporting package. There's also a standard interface between MICS and the Bundl output distribution product.

Candle has done a good job of integrating its Omegamon performance monitor with the AF/Operator console manager.

Tone Software's console management, scheduling and output products — Control-M, Control-O and Control-R — are also all highly integrated.

Q: What is the downside to full integration of automated functions?

A: The more you integrate, the more communication you need between functions. For example, if I change a program and it affects the contents of a report, then my balancing might not balance and the report could be distributed to the wrong people. Without automated change management, you're dead in the water. •

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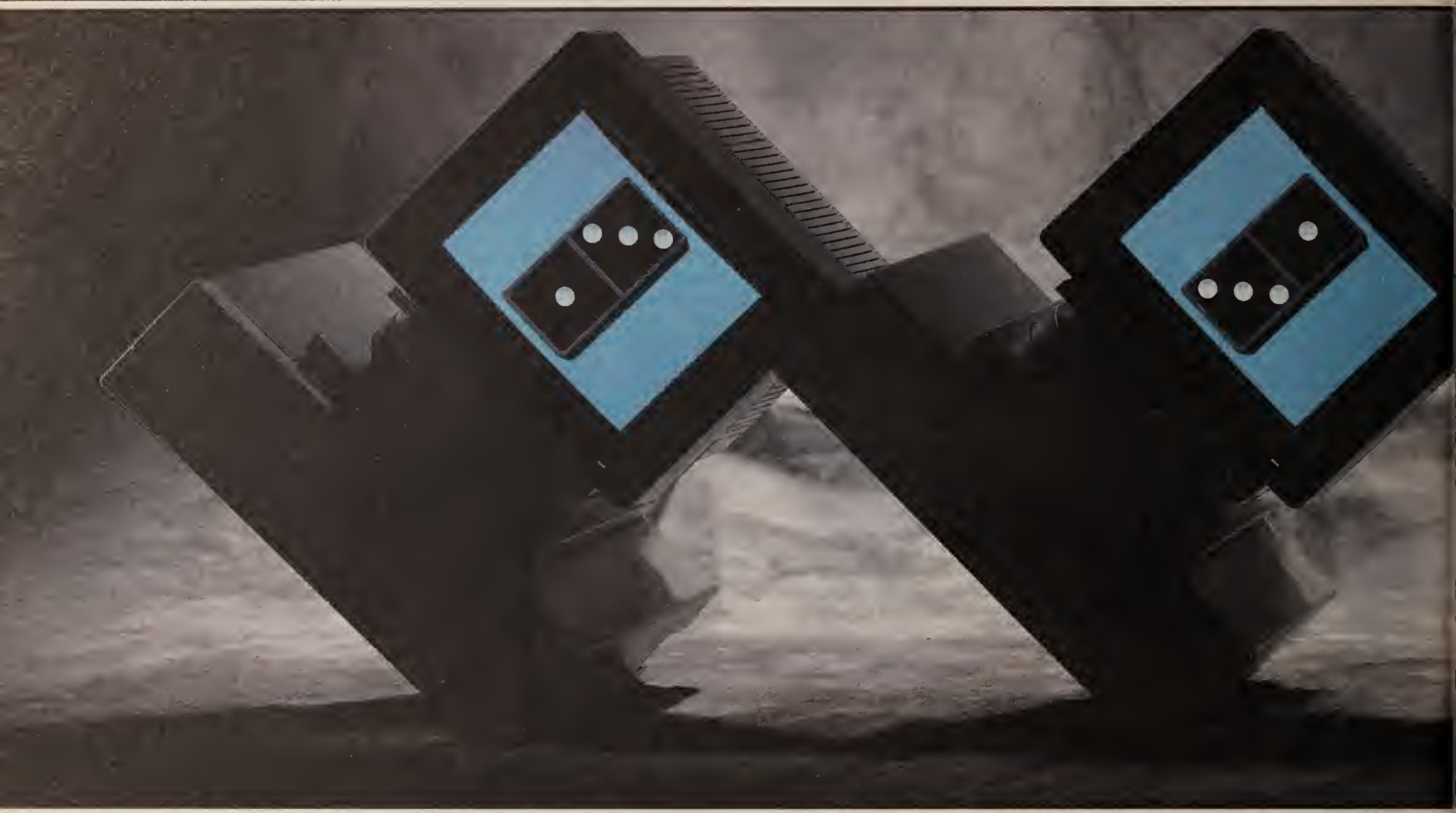

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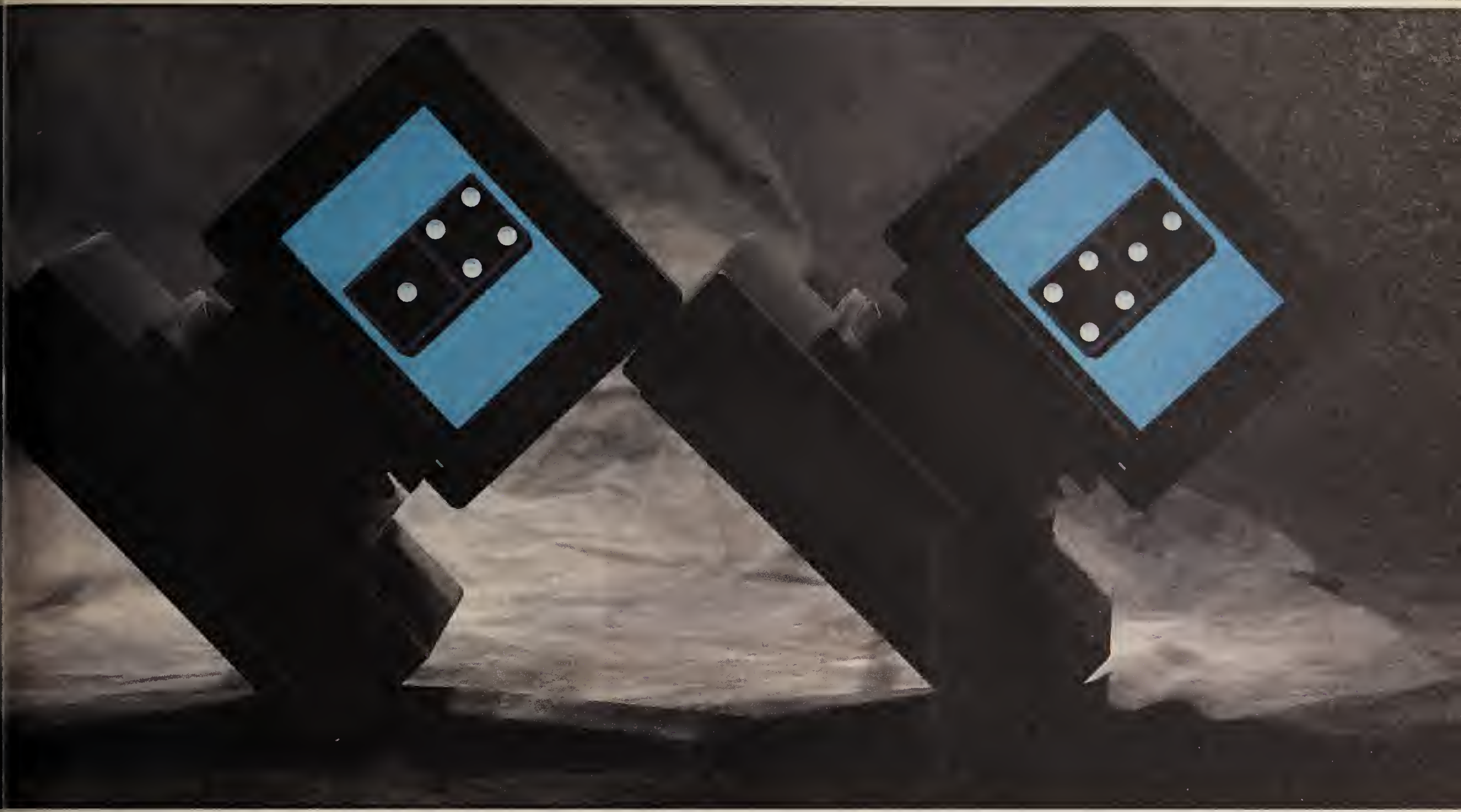

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What's missing from lights-out?

Tools have made strides, but expert systems, novel approaches still lacking

BY GARY ROBINS

When Ron Rubin started as data center manager at Credit Agricole's U.S. operations in Chicago, there were two computers and two people on staff: One day and one night operator kept watch over an IBM System/34 and a Digital Equipment Corp. VAX 11/785.

A year and a half, two VAX 6000s, a few Microvaxes and 90 MIPS later, the data center still requires only two operators during the week and runs unattended on weekends.

Credit Agricole's Rubin *says lights-out means management by exception*

How much closer to lights-out can you get? In Rubin's estimation: not much.

Rubin has implemented automation tools from DEC, including a console automation system, a systems integrity monitor and VAX performance monitoring software. He says he is about 75% of the way to unattended operations and is moving quickly toward 95%. He is doubtful, however, about the prospect for total lights-out operation.

"I don't think it is possible to get a 100% lights-out environment," he says. "We are still dealing with mechanical equipment, with unpredictable software. You will always have an environment subject to some sort of malfunction that will call for human intervention."

Most data center managers agree that automation tools have made great strides in the past five years, allowing some large shops to run unattended during a night shift or a weekend. Whether they start phasing out operators to any large degree, however, depends on how much further the tools advance and whether lights-out is really where data center managers want to be.

One of the areas in which Rubin would like to see a higher degree of automation is performance management. Current tools generate recommendations for solutions but depend on an operator to implement them. The ideal system, he says, would detect and then correct system problems on the fly.

While many people say console automation is a step toward lights-out operation, these tools need expert systems before they can fill in completely for a human operator, according to Joe Novoshielski, data center manager at SMS, Inc., which provides information processing services to the hospital industry. More than six million messages per week have been eliminated from the master consoles at the Malvern, Pa.-based firm via Legent Corp.'s Automation/MVS and IBM's Message Processing Facility, and many are responded to automatically.

However, expert systems will need to take the place of hard-coding to generate an appropriate response for more complex messages, Novoshielski says.

In some situations, such as tape backup, print distribution and maintenance, operators may never be phased out.

At least one operator is required in most organizations to mount and dismount tapes. For some large shops, robotics eliminates some of this manual procedure with automated tape libraries. At SMS, half of its 10,000 daily tape mounts are automated on six robotic tape silos made by Storage Technology, Inc. The firm hopes to automate 100% of its tape backup by 1991.

Smaller operations such as Credit Agricole would not be able to cost-justify the expense of putting all backup tapes on automated tape silos. Electronic vaulting is out of the question as well because of the expense.

Rubin hopes someday to use 8- or 4mm technology with automated tape cartridge feeders for a minimum amount of human intervention, but until there are improvements in cost, speed and capacity on these technologies, tape backup is a stumbling block.

Distributing reports can also stand in the way of 100% automation. At Manufacturers Hanover Corp. in New York, the printing buck is pushed out to the end user. Frank Noto, an assistant vice-president of automated systems development, hopes to eventually move all staff off the machine-room floor.

"If you define lights-out as just involving the processing of data in the CPU and DASD, it is possible to seal off the machine-room floor," he says. "If I/O functions like tape and print are included in the definition, it is more difficult to eliminate human intervention."

People's Bank in Bridgeport, Conn., has found a way around manual print distribution with IBM's Report Management Distribution System, which delivers reports electronically. The system has reduced printed output by 50%, Vice-President of Corporate Automated Systems Tom Scali says.

Maintenance is another area that still requires human intervention. While environmental monitors can detect hazardous conditions such as excessive temperature, low electrical supply or low water pressure, they cannot yet fix them.

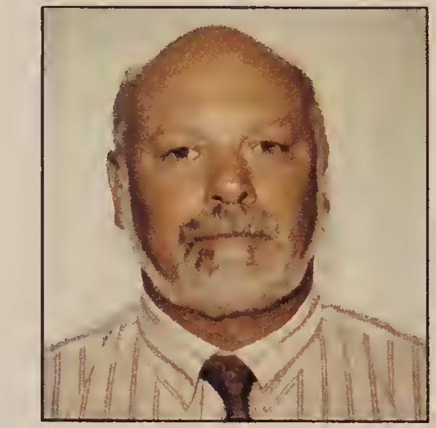
A few environmental firms currently market environmental monitors, but systems intended for data center use are just now appearing on the market. These are usually used in conjunction with an alerting system that calls in technicians or management to fix a problem such as failed air-conditioning.

"The monitor has to be connected to [expert systems] and needs to be able to notify management or emergency services once it senses that the air-conditioning has failed, or there is a fire or leak," Noto says.

At Credit Agricole, Rubin is looking at two products — an environmental monitor and an alerting system from DEC.

Some people argue that because current tools are based on human procedures, they are inefficient for unattended operations.

While current products automate manual functions, says Ed White, manager of software support at R. J. Reynolds Tobacco Co. in Winston-Salem, N.C., they should concentrate on developing new procedures.



Manufacturers Hanover's Noto *hopes to eliminate staff from the machine room*

"I don't necessarily want to do the same things we have been doing manually," White says. "I want to find out what the technology opens up for me that I have not been able to do before."

A data center with no human intervention may not always be what managers are looking for, however. "For me, lights-out means management by exception," Rubin says. "Let the tools detect the errors, let the interfaces alert me to the errors, and that is when I want to get involved." •

Robins is a free-lance writer based in Northfield, Minn.

Help desk systems emphasize prevention

BY DAVID KUCHES

Automation and help desks have not always gone hand in hand. Problem-logging software and call-routing systems have been around since the early 1980s, but only recently have they garnered much interest. About 25% to 30% of large information systems organizations use call-routing systems, and while 50% of large IS groups have invested in problem-logging software, it often falls into disuse.

New capabilities on these systems are starting to turn people's heads. Today's systems can alert the help desk to problems before they affect users, solve common problems without human intervention and train new help desk staff by using expert systems.

Early versions of problem-logging software were mainframe based and allowed help desk staff members to log problems in standardized, record form in a centralized database.

On newer versions, built-in interfaces to work-load and network management software offer automated problem-logging capabilities. When these tools detect problems on the system or network, they automatically log them in the help desk's central repository, alerting the help desk before users experience major problems.

Major vendors of mainframe-based problem management software include IBM, whose Info/Mgt tool holds 50% of the installed base; Computer Associates International, Inc.; Peregrine Systems, Inc. and Infolink Software, Inc. Prices range from $30,000 to more than $100,000.

On midrange systems, Answer Computer, Inc.'s Apriori incorporates an experience-based learning engine that keeps track of common problems. The system can then present these to the help desk staff during the problem determination process.

Apriori runs in the Sun Microsystems, Inc. Unix environment and costs $5,000 per user.

Many firms are considering personal computer-based local-area network versions, which have started to appear in the last year. While at least six vendors offer such tools, Bendata Management Systems, Inc.'s Help Desk Expert Automation Tool (HEAT) and IBM's Problem Management Productivity Services (PMPS) are two that incorporate expert system capabilities to train new help desk members in the problem determination process. The expert system is also used to help veteran staff members work through more complex problems.

The PC LAN-based products that don't use expert systems range in price from $1,500 for a single-user license to $5,000 for a LAN. A HEAT license is approximately $7,500 for one workstation networked version, and PMPS initial license fees are $4,000 to $7,000, with a monthly rental fee of $400 per terminal.

Capture and report

It is an improved reporting mechanism that has people thinking twice about telephone support systems. These systems follow a preset sequence to route calls or distribute them to help desk personnel based on who has had the least amount of call activity in any given period of time.

More recent systems capture such data as the average number of rings before the call is answered, average time per call and number of abandoned calls. This data can be downloaded to a floppy disk for managers to use to assess the quality of support being provided.

Pricing on a system with automated sequencing, such as Aspect Telecommunications' Aspect Call Center, is about $5,000. For a system from Rolm Systems or AT&T that captures data for reports and performs automated distribution, prices can range to $100,000.

An up-and-coming subset of telephone support systems is voice response units. Since the mid-1980s, these systems have routed callers to appropriate help desk personnel by prompting the caller to select numbers on the telephone key pad.

More recent devices answer user questions or solve the problem themselves. If the caller wants to reactivate his terminal, he enters his terminal identification number, and the system reactivates the terminal through telecommunications lines into the control unit.

If the caller is curious about the status of his work record, the system can allow him to access the help desk database. A four-line coaxial-connected Infobot unit is priced at $20,000. On the lower end, Intervoice offers Robotoperator for $100 to $140 per month with a monthly maintenance fee of $200. •

Kuches is president of Systems Management Engineering, Inc., a firm that specializes in the automation of help desk functions.

Console automation software

VENDOR	PRODUCT	HARDWARE ENVIRONMENT	OPERATING SYSTEMS SUPPORTED	MESSAGE HANDLING FUNCTIONS	ERROR NOTIFICATION ALARMS	AUTOMATIC COMMANDS ISSUED BY SYSTEM	EXPERT SYSTEM OR AI RESPONSES	INBOARD OR OUTBOARD SYSTEM[1]	INDICATORS RECOGNIZED AND ACTED ON	ALLOWS REMOTE IPL[2]	MENU- OR COMMAND-DRIVEN	OTHER AUTOMATION TOOLS INTEGRATED WITH	TRAINING INCLUDED IN PRICE	PRICE RANGE
A.Y.D.E. Software Solutions, Inc. **(404) 786-1686**	RASP	IBM MVS machines and compatibles	MVS, any release	All[3]	Dial out to on-call operator, flashing on-screen message	Any operating system commands, such as system or database shutdown, damage assessment	Checks dependencies before issuing restarts, if-then logic	Inboard	All[4], plus time of day, date, status variables	Yes	Either	IBM Netview, Landmark T-MON, CA-7 and CA-Scheduler	Yes, through Dec. 1990	$15,000 - $50,000
Altai Software **(800) 227-7774** **(817) 640-8911**	Zack, Zack PC	IBM machines running operating systems listed at right	MVS, VSE, VM, DOS	Delete, highlight, hold reroute, suppress, scroll, color display, revise	Dial out to on-call operator, message sent to system user	Any operating system commands, such as restart job, VTAM commands, limit access	If-Then logic for making conditional decisions, intercepts commands from users	DOS version is outboard; others inboard	Message number, job name, machine ID, wild-card characteristics, frequency of occurence	Yes	Menu	Altai's Zeke, any program with a callable subroutine	Yes	$7,500 - $21,000
Candle Corp. **(213) 207-1400**	AF/Operator	IBM 370 and compatibles	MVS, MVS/XA, MVS/ESA	All	Dial out to on-call operator, audio (voice) notification, flashing on-screen message, beeper paging	Restart job, reboot system, limit access, change management, problem logging, problem escalation	User-defined, including operating system and panel driven library commands, interface to expert system software, if-then logic	Either	All, plus Omegamon and other VTAM applications	Yes	Either	Any VTAM application	Yes	$18,000 - $60,000
Carolian Systems **(416) 637-0400**	Galcon	HP 3000 and 9000, DEC VAX MPE/V, MPE/XL, HP-UX, Ultrix, VMS	Automatic response, rerouting, suppression, logging	Audio (voice) notification, bell or buzzer, flashing on-screen message	User-defined	Calling any exterior program, restart machines and down lines, other user-defined commands	Logical modeling, programming language for user-defined responses	Inboard	Message number, job name, machine ID, wild-card characteristics, frequency of occurence	Yes, on HP 3000	Command	Any external program that can send messages to a message file	No	$50,000 +
Computer Associates International, Inc. **(516) 227-3300**	CA-Opera, CA-Opera/PC	Compaq 286E, Compaq laptop, machines running MVS, VM, VSE,	MVS, VM, VSE	Highlight, hold, reroute, suppress, log	Dial-out to on-call operator	Operating system and user-defined commands	System shutdown, IML or IPL, other user-defined commands specific to event or time, rules-based	Opera/PC is outboard; Opera is inboard	All, plus message text, job class and type	Yes	Menu	CA's Scheduler, Dispatch, Netman, CA-7, CA-1, APCDDS, Look, IBM Netview	No	$22,800 - $51,760
Cybermation, Inc. **(416) 479-4611**	MVS Co-Pilot	Any MVS machines	MVS, MVS/XA, MVS/ESA	Delete, highlight, hold, reroute, suppress, review, log, color display	Flashing on-screen message	Any operating system and ESP job scheduling commands	Expert system shell for user-defined functions	Inboard	Message number, job name, accounting code, wild-card characteristics, frequency of occurence	No	Either	Cybermation operations software products	Yes	$18,000 - $25,000
Digital Equipment Corp. **(508) 467-4112**	Vaxcluster Console System (VCS)	Any machine supporting RS232 line and ASCII text	Independent of operating system	Highlight, scroll, review, log, color display, consolidate messages from multiple consoles	Audio (voice) notification, flashing on-screen message, color change on icon map of computing resources, electronic mail, other user-defined notifications	Any that would otherwise be issued manually, including operating system commands	Any user-defined commands via programming scripts	Outboard	Matching of arbitrary error message strings	Yes	Either	DEC's DECalert, DCM - Data Center Monitor, REMS - Remote Environmental Monitoring System, mcc NetStation, DEC-scheduler	No	$4,339 for 4-node license
EDP Systems, Inc. **(904) 575-0179**	A S Exec	Unisys A series machines	MCP versions 3.7 to 3.9	Delete, highlight, hold, reroute, suppress, review, log	Bell or buzzer, flashing on-screen message, put job in waiting queue	Job restart, file removal, network and operating system commands	User-defined valid A Series responses via macro language	Inboard	Job name, accounting codes, wild-card characteristics, frequency of occurence, token matches	No	Menu	EDP's A S Exec/Job, Print, and File, Unisys Work Flow Langauge	Yes	$5,000 - $15,000
	LIONL/Job Flow	Unisys V series machines	All Unisys V series operating systems	Automatic response, suppression, reviewing, logging	Recurring prompts on-screen	Any operating systems commands	User-defined via it-then logic	Inboard	Message number, job name, accounting codes, machine ID	No	Both	ESI's Basys, Computer Systems International's Help	Yes	$17,000 - $32,000; includes console automation, job scheduling and tape management modules
Empact Software **(404) 483-8852**	WTO-Manager	Any MVS machines	MVS/SP, MVS/XA, MVS/ESA	Delete, highlight, bold, reroute, suppress, color display, counters, SMF records	Flashing on-screen message, TSO notify message	Any operator commands vis internal programming language	User-defined via if-then logic	Inboard	All, plus time of day	No	Command	Responds to any message that appears on MVS console from any software package	No	$4,500 - $12,500
Goal Systems International, Inc. **(800) 829-9000**	OPS/MVS	IBM mainframes and compatibles	MVS/XA version 2.2 and higher	All, plus re-wording	All, plus beeper paging	Any operating system command, including restart job, limit access, all TSO, MVS, JES, CICS and IMS commands	User-defined via expert systems interface module	Either	All	Yes	Menu	Any products with VTAM interfaces, IBM Netview	No	$9,500 - $54,500
	FAQS/ASO for VM	IBM 3270, 3290 and compatibles	VM/SP, VM/XA	All	Bell or buzzer, flashing on-screen message	Any operator commands based on user-defined criteria	Message-triggered execs and user-defined via if-then logic	Inboard	Message number, text or origin, wild-card characteristics	No	Command	Goal Systems' Alert/VM, IBM RACF	No	$7,500 - $14,000

[1] Inboard means that the product runs under the operating system of the mainframe. Outboard means that the product runs independently of the mainframe.

[2] IPL — Initial Program Loading.

[3] When "All" is given as a response in the Message Handling Functions column, the following features are included: deleting, highlighting, holding, rerouting, suppression, scrolling, reviewing, logging and color displaying.

[4] When "All" is given as a response in the Indicators Recognized and Acted On column, the following features are included: message number, job name, accounting codes, machine ID, wild-card characteristics and frequency of occurrence.

[5] When "All" is given as a response in the Error Notification Alarms column, the following features are included: dial-out to on-call operator, audio (voice) notification, bell or buzzer and flashing on-screen message.

All products can operate as a remote console for a second site, except those from Empact Software, Mobius, Systems Center, Votek Systems and FAQS/AS for VM from Goal Systems.

The following vendors offer a PC interface for automatic IPL: A.Y.D.E. Software Solutions, Altai Software, Candle, DEC, Goal Systems (except on its FAQS/AS for VM), Legent, Operations Control Systems and Votek Systems.

The companies included in this chart responded to a recent survey conducted by *Computerworld.* When a vendor is unable to provide specific information about its product, the abbreviation NP (not provided) is used. When a question does not apply to a vendor's product, the abbreviation NA (not applicable) is used. Further product information is available from the vendors.

VENDOR	PRODUCT	HARDWARE ENVIRONMENT	OPERATING SYSTEMS SUPPORTED	MESSAGE HANDLING FUNCTIONS	ERROR NOTIFICATION ALARMS	AUTOMATIC COMMANDS ISSUED BY SYSTEM	EXPERT SYSTEM OR AI RESPONSES	INBOARD OR OUTBOARD SYSTEM[1]	INDICATORS RECOGNIZED AND ACTED ON	ALLOWS REMOTE IPL[2]	MENU- OR COMMAND-DRIVEN	OTHER AUTOMATION TOOLS INTEGRATED WITH	TRAINING INCLUDED IN PRICE	PRICE RANGE
Goal Systems International, Inc. **(800) 829-9000**	FAQS/ASO for VSE	IBM 3270 and compatibles	VSE/SP, version 2.1 and higher	All, plus message text changes, masking, time stamping	Flashing on-screen message	Any DOS attention routine, DOS Power or VTAM commands, REXX Execs	Operating system commands via System Function package for VSE, restart VTAM lines after CICS shutdown, REXX Execs for VSE	Inboard	Message number, job name, machine ID, wild-card characteristics, frequency of occurence, time ranges, partition ID, phase number	No	Either	Goal Systems' FAQS, FAQS/PCS, FLEE, FAVER, Explore/VSE, Alert/VSE, Extend/VSE, VSAMaid and Mastercat	No	$7,500 - $11,000
ISA Solutions **(800) 462-6301** **(708) 677-3530**	ISA/Sysmaster	DEC VAX	VAX/VMS version 4.7 and higher	Automatic response, rerouting, logging	Flashing on-screen message, mails user	DCL-like programming script language	Signals alarm, mails user, other user-defined responses via if-then logic	Inboard	Job name, user-defined variables such as disk space allocation, I/O operating rates, system parameters	No	Command	ISA's OperMaster, NetMaster and TaskMaster	No	$1,295 - $12,000
Legent Corp. **(412) 323-2600**	Auto Mate series	Any machines that support IBM 3270 consoles, IBM PC AT, PS/2 and compatibles	MVS, any release; VM/SP 4.0 and higher, VM, SP HPO 4.0 and higher, VM/XA 2.0 and higher	All, plus rewording message text	All[5], plus color-coding messages, passing messages to large-screen display monitors	Restart job, reboot system, limit access	Commands issued through expert system rules-based language, supports IBM Expert System Environment	Auto Mate/MVS and VM are inboard; Auto Mate/XC is outboard	All, plus programmer name, job number, other variables created with applications programming interface	Yes	Auto Mate/MVS and VM use menus or commands; Auto Mate/XC uses menus	Any VTAM applications	Yes	$2,000 - $6,000 for Auto Mate/XC; $6,000 - $18,000 for Auto Mate/VM; $10,000 - $30,000 for Auto Mate/ MVS
Mantissa Corp. **(205) 945-8930**	Console/Master	IBM 370, 4381, 3080, 3090	MVS/SP, MVS/XA, MVS/ESA	Delete, highlight, hold, reroute, suppress, reformat	On-screen user message	Operating system commands, some VTAM commands	Reactivates VTAM nodes, brings system up or down, brings CICS, IMS up or down, communicates with scheduling system	Inboard	Message number, job name, machine ID, wild-card characteristics	No	Menu	Any scheduling or network systems that support console notification	Yes	$5,500 - $95,000
Mobius Management Systems, Inc. **(914) 632-7960**	Infopac-Opman	IBM MVS machines and compatibles	MVS/SP, MVS/XA, MVS/ESA	Review, log, color display, measure operator response time to WTOR, UREC, tape mount messages	Flashing on-screen message, highlights responses to messages that exceed user-defined thresholds	None, monitors console messages, does not respond	Internal sampling logic	Inboard	Job name, frequency of occurence	No	Menu	Any MVS-compatible products	No	$10,000 - $20,000
Morss Software Development, Inc. **(206) 455-1838**	Q7 Monitor	DEC VAX	VMS	Delete, hold, suppress, scroll, review, color display	Flashing on-screen message, VMS mail	None, monitors console messages, does not respond	None	Inboard	Message number, job name, wild-card characteristics	NA	Menu	VMS operator	No	$1,497- $10,500
Operations Control Systems **(415) 493-4122**	Watch-It	Runs on IBM PC and compatibles; interfaces with machines running operating systems listed at right	MVS, VM, VMS, MPE, Unix	All, plus command scripts, message analysis	All	Any operating system commands via user-defined scripts	User-defined through logical modeling	Outboard	All	Yes	Menu and icon-based interface	Operations Control Systems' Librarian, Tape, Space Control, Chargeback and Private	No	$10,000+
Planit Systems, Inc. **(408) 737-1555**	The Daily Planit	Unisys 1100, 2200	Exec 8	Log	Error log, flashing on-screen message	Start job, job status	Retries job, delays response, manages unscheduled jobs, schedule calendar for 2 years in advance	Inboard	Job name, frequency of occurence	No	Either	Formula Consultants' Star-100 Tape Management System, Votek's T16-100	Yes	$28,000 - $31,000
Smartech Systems, Inc. **(800) 537-6278** **(214) 956-8324**	DOCS/VSE Console Automation Software	Any VSE mainframes, IBM 3270 and compatible terminals	DOS/VSE, VSE/SP, MVT/VSE, VM/SP, VM/HPO, VM/XA	Highlight, suppress, scroll, review, log, color, performance and status displays	Bell or buzzer, flashing on-screen message	Restart job	None	Inboard	Message number	Yes	Command	Altai's Zeke and Zack	Yes	$9,000
Software Engineering of America **(516) 328-7000**	MECO	IBM mainframes and compatibles	MVS, MVS/XA, MVS/ESA	Automatic response, deleting, rerouting, logging, color displaying	Dial out to on-call operator, flashing on-screen message, beeper paging, escalation procedures	Any operating system commands	User-defined via if-then logic	Outboard	Message number, job name, machine ID, wild-card characteristics, user-defined variables	Yes	Menu	Any products sending messages through an MVS machine	No	$14,700 - $24,500
	ODDS/MVS	IBM mainframes and compatibles	MVS, MVS/XA, MVS/ESA	All, plus time-intensification of message	Bell or buzzer, flashing on-screen message, color-coded alarms, notification of TSO users	Reboot and reload system, simplify, restrict access, operating system commands, Trigger relays, TSO CLists and REXX execs, rules-based decision making	TSO CLists, REXX, status variables, user-defined responses	Inboard	All, plus descriptor and routing codes based on time, date or event, address space initiation	No	Both	Any products sending messages through an MVS machine	No	$14,700 - $24,500
Startech Software Systems, Inc. **(212) 943-9800**	Auto-Answer	Any VSE- or VM-compatible machines	VSE, VM	All	Bell or buzzer	Any operating system commands	User-defined via if-then logic	Inboard	Message number, wild-card characteristics	No	Menu	Any compatible with VSE or VM operating systems	No	$4,500
System Center, Inc. **(703) 264-8000**	Sys/Master, module of Net/Master	IBM 370 and compatibles	MVS, VM	All	Flashing on-screen message messages to multiple consoles	Operating system, subsystem (IMS, CICS), VTAM, REXX and user-defined commands	Expert system foundation module	Inboard	All	No	Either	Any VTAM application tool that can send messages to console	No	$10,000 - $28,600
Systemetrics, Inc. **(617) 868-8308**	Sentry	DEC VAX, any ANSI terminal	VMS	All	All, plus e-mail and electronic pager	Restart job, kill job, reboot system, other user-defined commands	Notification by exception, user-defined responses using conditional logic	Either	Message number, job name, machine ID, wild-card characteristics, frequency of occurence, device or type, user name, time of day	Yes	Either	Systemetrics' Network Security and System Performance Monitors	No	$540 - $250,000
Votek Systems Ltd. **(416) 889-7977**	The Intelligent Console (TIC)	Runs on Compaq 286- or 386-based machines; interfaces with machines running operating systems listed at right	MVS, VM, Guardian, MCP, 1100 O/S, Primos, GCOS, MPE, HP-UX, VMS, AOS, VS	All	All	Any operating system commands	User-defined via parsing, if-then logic and knowledge base	Outboard	All, plus any user-defined syntax	Yes	Menu	Any tool that runs on 3270 machines	Yes	$70,000 - $100,000

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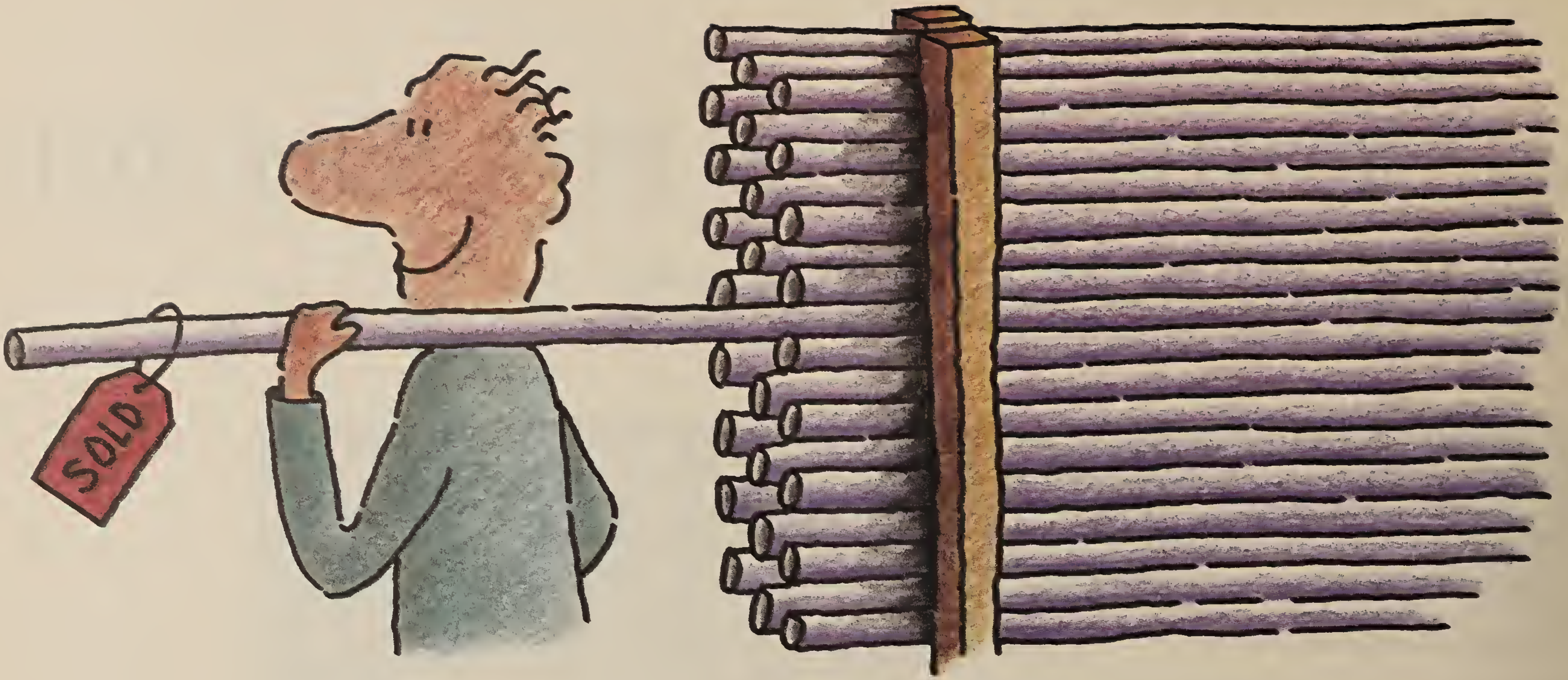

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Let the customer do it

From grocery robots to photo kiosks, computerized self-service is in

BY JERRY KANTER, STEPHEN SCHIFFMAN AND J. FAYE HORN

Michael Siggins

Remember the scene in *The Adventures of Tom Sawyer* in which Tom gets his friends to do his whitewashing chore by convincing them that it's a privilege? Today, companies are exercising that same approach by using technology to get customers to do their work for them.

Maturing technologies, such as personal computers, networking and electronic data interchange, hold the promise of improving customer service while managing the growing labor cost of customer transactions. The new approach? Let the customer do it.

Examples of do-it-yourself point-of-sale (POS) technology are becoming more common each day: In addition to using the ubiquitous automated teller machine (ATM), travelers can now do self-ticketing of airline flights and use self-actuated kiosks to buy insurance policies and mortgage options. You can also design your own deck or price a new car, all by keying in your requirements.

In certain areas, fully automatic gas stations enable you to pump your own gas and pay by credit card — without a human attendant. Citicorp has developed a telephone with a built-in screen to facilitate banking at home. Home buying services such as Compuserve, Inc.'s Compuserve, which has been in business for years, are being joined by new competitors.

Yet the idea of letting the customer do transaction processing is not new. Users have been dialing telephone calls without operator assistance since the 1920s.

Today, two major factors are driving the rapid growth of self-service systems: improved technology and business pressures. Until recently, transaction processing was handled exclusively by large mainframe systems. The advent of minicomputers and PCs, along with better, more reliable networks, has changed all that. Tied to bar-code scanning and other POS devices, these electronic links have been extended from the retail store directly to customers.

The bottom line is that today's technology allows the capture of transactions at the point of sale, integrating them electronically with a company's billing and order-replenishment systems.

And organizations everywhere are under great pressure to make technology investments pay off.

Not just an option

Letting the customer do it may be more than just an option. Research company American Demographics points out that a fast-growing elderly population, declining numbers of young adults and a record low population growth rate will put the nation in a demographic vise in the 1990s. Nationally, the 20 to 29 age group is projected by the U.S. Census Bureau to drop 12.5% during the next decade. With the continued growth of a service-oriented economy, there may not be enough people to satisfy the demand for retail clerks and service attendants.

These demographic shifts are forcing retailers, financial service providers and other firms that deal directly with consumers to take a hard look at customer self-service systems. The approach could become a key determinant of survival for some industries.

Beyond survival, many businesses implement self-service systems for other reasons. Cost leadership, product differentiation, bigger market share or strategic advantage are among the possibilities.

For example, an ATM can help a bank reduce its labor expenses and thus provide a cost leadership position in the industry. As a technology, ATMs can help distinguish a bank's services from its competitors. Sears, Roebuck and Co., for instance, may support Prodigy Services Co.'s Prodigy to exploit a market niche not currently addressed through catalog or showroom sales channels.

Self-service systems can also help customers with various stages of the buying cycle. Weyerhauser Co.'s design-a-deck system, for example, helps the customer establish requirements. Prodigy allows the customer to select, order, pay for and acquire a product. ATMs let customers acquire cash and monitor their accounts. Avis, Inc.'s ATM-like machines allow customers to

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- **Technology eliminates middlemen**
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expedite car-rental returns. The biggest payoffs come from applications that support many buying steps.

However, it is clear today that competitive advantage gained through information technology is not necessarily sustainable. Even small banks eventually responded to the ATM challenge and joined regional and national bankcard networks. This in turn forced leading banks to evolve their ATM services in order to stay ahead of the competition. Baybanks, Inc., for instance, has introduced a service that allows the customer to keep an eye on which of their checks have cleared most recently.

Looking at three technologies — ATMs, automatic checkout machines and the Prodigy home buying service — provides a good insight into the current state of the do-it-yourself movement.

ATMs: More for the money

In the 20 years since their introduction, money machines, or ATMs, have become an accepted method of convenient access to cash. Financial institutions originally intended ATMs to provide customers with convenient banking services at lower costs than tellers' salaries. By 1988, approximately 65,000 ATMs were in use in the U.S., handling nearly half a *trillion* transactions. Nearly half of all cash withdrawals are made from ATMs. In fact, ATMs are so common today that for most of the U.S., automated banking is no longer a differentiator between financial institutions. ATMs have become a commodity service as common as telephone booths.

> CUSTOMERS WILL have their own "individual bank" custom-designed to meet their personal banking, investment and transactional needs.

As a result, banks are looking at two major strategies to increase ATM profitability. One is to join nationwide network systems, such as Cirrus, that permit users to access cash outside of the bank's regional area. The other is to increase the range of services and their attractiveness to ATM users and generate revenue from new fees.

The new challenge for bankers is twofold: Offer profitable services and convince customers that automation is the most effective way to conduct their financial affairs. Some innovative options are within one or two years of implementation. These will require rethinking the role of automation in financial institutions, and in some cases, the nature of the banking business itself. Institutions will probably rely heavily on frequent use bonuses and other use incentives.

Dale L. Reistad, president of the Electronic Funds Transfer Association, predicts that ATM cards will evolve eventually into "supersmart cards" with key pads, readouts and a small battery. These cards will be used not only for personal banking but also for stock transactions, worldwide special-interest electronic mail systems and accessing a variety of databases.

Reistad suggests that the end result in the U.S. will be that customers will have their own "individual bank" custom-designed to meet their personal banking, investment and transactional needs.

Checkrobots: New wave market

A different twist on customer self-service systems has less to do with dollars than with doughnuts. The Automated Checkout Machine (ACM) System, a product of Florida-based Checkrobot, Inc., enables shoppers to check out their own merchandise before paying a centrally located cashier. It incorporates a security system to ensure that each item departing the store has been scanned and paid for. Laser scanning, local-area networks and database management systems are combined to produce a user interface with the store's central computer.

Checkrobot claims that ACM System offers the perception of improved customer service because the automated checkout machine is easy to use, decreases shopping time and increases customers' control over their shopping environment. It also says the system provides a high return on investment, primarily because of decreased labor costs. While the current target market is supermarkets, the company plans to expand to retail organizations in general.

ACM System consists of automated checkout machine stations, a central computer linked to the stations and a POS computer. The automated stations are made up of five parts: a laser scanner, which reads bar-code labels; a color video touch screen, which displays a complete description of the items being purchased, along with their prices and a running subtotal; a produce key pad and produce video screen for handling produce and other variable-weight bulk items; a proprietary and patented merchandise security system; and a conveyer belt that moves through the merchandise security system to the bagging area.

Checkrobot developed ACM System as a response to the evolving retail market and shrinking labor pool. The company claims that automated checkout machines can not only cut down on staffing

needs but also lower costs and increase profitability. Checkrobot estimates that one cashier is needed for every three to four automated checkouts, plus one optional bagger (usually working for a lower wage than checkout operators) for every one to two checkouts.

Beyond cost savings, the system also offers the promise of a competitive advantage. Increasingly, customer service in supermarkets is becoming a big differentiator in a competitive industry. By far the most important factor is efficient, speedy checkout.

Customers seem to think that automated checkout machines work. Independent research found that more than half of the users surveyed said that the systems were "much faster" than conventional checkouts; two-thirds preferred the automated checkout machine to a conventional checkout, perceived self-scanning as an additional service offered by the store, thought overall service was better than in stores without automated checkout and thought their overall checkout time was shorter than prior to the installation of the machines. In addition, five-sixths of the respondents labeled the automated checkout machines as easy to use.

Why does this high-tech system cause a perceived improvement in a low-tech area such as customer service? In general, it is because customers judge service quality perceptually, not quantitatively. There are four possible reasons for this perception.

First, autoscanning responds to shoppers' No. 1 complaint: waiting in line. Automatic checkout machine-equipped lines are always open, regardless of the number of checkout operators working at the time. (The actual time spent scanning is longer, however.) Customers do not operate the scanning system as fast as trained employees. But the longer real time does not affect their perception of faster checkout.

Second, customers perceive autoscanning as more accurate than staff-operated scanning systems. As they scan, the customer can see the item listed with its price on the video screen and then verify its accuracy.

Third, customer research indicates that automatic checkout machines are readily accepted across demographic

Self-serve success

What makes some self-service systems become part of everyday life quickly, while others never seem more than expensive, awkward monstrosities?

- **A perception of benefit.** Customers are willing to operate a transaction processing system if they perceive a benefit greater than the effort of doing it themselves. Prodigy may not shorten delivery time, but customers may still view it as a sales aid. If transaction processing does not appeal to some buyers' purchase criteria in a meaningful way, it may well fail to gain acceptance.
- **Rapid response and a good interface.** High bandwidth is key here. Transaction speeds — and thus satisfaction — are affected by communications between the customer's input device and the rest of the transactional system.

High bandwidth allows for both rapid response time and the use of a user-friendly graphical or video interface, such as the one currently found in Checkrobot's ACM System.

There are limitations, though. Prodigy's user interface certainly yields much higher bandwidth than text-oriented videotex systems, which have fared poorly in the past, yet Prodigy still cannot compete with the high-bandwidth environment of a glitzy, live display of merchandise in a store or even with television advertisements.

- **Ease of use.** Beyond a good interface, ease of use also depends on the complexity of information exchanged between the customer and the transaction processing system. For example, when a customer wants cash, he decides to withdraw an amount — say $50 — and tells the ATM.

Compare this with a novice ordering a fly-fishing rod through Prodigy. A good salesperson would know that certain rods are suitable for saltwater fishing, others for river fishing and still others for lake fishing. If the customer is not prompted for specific requirements, he could well end up with the wrong rod.

- **Native intelligence.** Built-in artificial intelligence or other "smart" capabilities can make self-service systems more useful, because such systems can aid in the interchange of complex information between the customer and the system. For example, the leading producer of elevators, Otis Elevator Co., provides its customers with PCs and the required software to guide them in selecting, ordering and scheduling the construction of elevators.

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If the financial benefits of ACM System are firmly established, autoscanning may become a familiar everyday part of life — just like ATMs.

Prodigy: A promising infant

Prodigy Services, a joint venture combining IBM's technological expertise and Sears' retailing expertise, offers PC owners an "on-line electronic mall of information and shopping services." Operating from telephone networks connecting 22 minicomputer centers around the country, Prodigy provides shopping, banking, news and database access to an estimated 160,000 subscribers.

Prodigy's launch in October 1988 was greeted with skepticism because of the earlier failures of similar ventures. In particular, home banking services were expected to be widely accepted when they first became available in the mid-1980s. But earlier technology was not user-friendly, and applications were not geared to the mass market. Thus, those systems disappeared.

Prodigy faces stiff competition. Not only do 1.3 million computer owners subscribe to similar systems such as Compuserve, but telephone companies are also starting information ventures of their own. However, according to Sears Chairman Edward Brennan, Prodigy's edge is that it is broader and less expensive than its competitors.

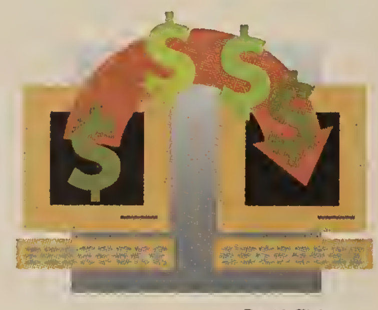
To meet mass-market appeal, Prodigy is menu-driven and friendly and costs $9.95 per month for unlimited use. Subscribers can order from Sears, J.C. Penney Co. and 45 other direct-mail retailers. They can also bank with more than a dozen affiliates, including Manufacturers Hanover Corp., and make plane reservations through American Airline's Sabre system. A wide range of news, financial and entertainment sources are also available.

The deliberate mass nature of Prodigy's marketing appeal has another advantage: It provides an attractive advertising medium. Almost 200 companies, including American Express Co. and J.C. Penney, pay Prodigy every time an advertisement is accessed, a lead is generated or a product is sold.

Edward Papes, Prodigy's chief executive, says he doesn't expect Prodigy to break even for another few years. However, IBM and Sears say they consider Prodigy a long-term project. If Prodigy continues to upgrade its electronic package for a growing market, it could change how Americans acquire a wide variety of goods and services.

Letting the customer do transaction processing is not a fad. It is driven by such factors as population demographics and industry competition.

As with the introduction of any new technology, some will fail, and some will succeed. Technological improvements in computing hardware and software and in the telecommunications infrastructure will allow for the introduction of new customer-driven systems. The successful ones will provide a perceived benefit to customers by convincing them, as Tom Sawyer did, that "it's a privilege." •



David Flaherty

New ideas for self-service

Several promising technologies are emerging that will allow customers to handle more of the ordering burden:

Multimedia. A host of devices now coming to market will transmit video, voice and even three-dimensional pictures to potential customers. For example, a real estate office can simulate a walk through a house, or an architect can superimpose a home or garden addition to an existing property.

Automatic scanning devices. In a Milan, Italy, bank, for example, a customer can stack his U.S. bills in a device that returns lire and an itemized record of the transaction. The device handles 16 different currencies. And the scanner reportedly does a much better job than the human eye of detecting counterfeit bills.

Voice recognition. Like optical scanning, this is another powerful option. It works on the premise that most people are more comfortable speaking than keying or typing. A few working applications are in the field, and research continues. One system employs a chip in an ATM card that will verify the voice of the cardholder. This can be considered a "voice print" and offers voice withdrawals as opposed to the current method of using a key pad.

Handwriting recognition. Akin to optical scanning are machines that can read printed writing. Their use would allow office workers and customers to record information in the same way they always have — by filling in the blanks and checking off boxes. The potential also exists for processing handwriting in foreign languages with automatic translation.

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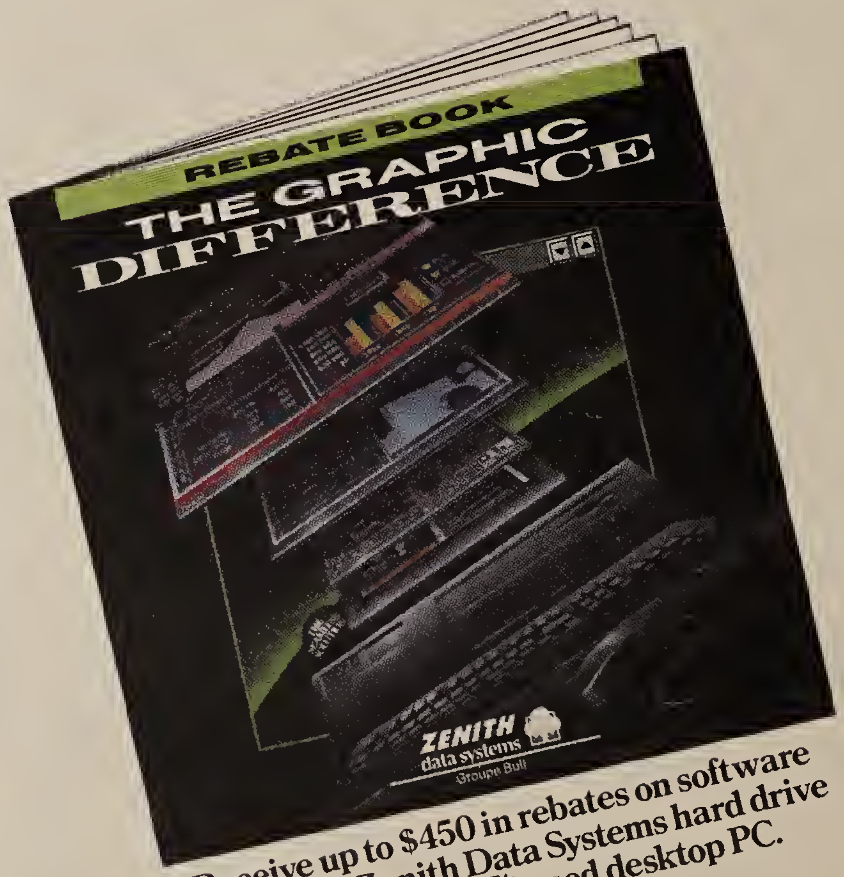

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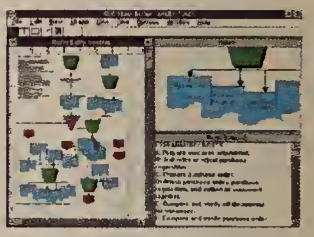

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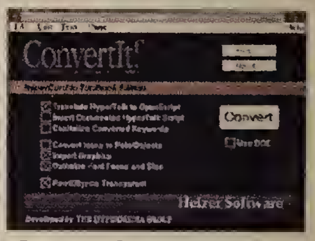

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What's up and coming in self-service

The United States Postal Service has completed installation of its new **Faxmail** network. The self-service system is offered in 263 post office lobbies around the country. Terminals are owned and maintained by Hotelecopy, Inc., a Miami-based company with the world's largest public-access facsimile network.

Aimed at small business and residential customers, the service has been well received, postal officials say. Optional services include confidential store-and-forward and mailbox features, typing of handwritten documents, translation into 14 languages, typing from dictation, faxing to multiple locations with a single call, desktop publishing and fax-to-telex service.

Faxmail terminals accept most major credit cards and send and receive both domestic and international fax messages. Domestic service, including any long-distance phone charges, costs $8.50 for three minutes (five to six pages) and $1.50 for each additional minute.

International messages cost $8.50 plus $2.50 per additional minute, regardless of destination.

•

IBM and Delphi Technology announced an agreement to develop **automated photo machines.** Delphi, an Atlanta-based photo processing company, will design the automated photo machine interactive multimedia merchandising kiosk. IBM will manufacture the units at its facility in Charlotte, N.C.

David Flaherty

The companies say that the machines will provide consumers with a convenient way to process their photographic film. The self-service will feature touch screens so that customers can easily process their orders. Kiosks will be located in high-traffic consumer locations such as supermarkets, large office buildings and mass-market retailers and will be available 24 hours a day, seven days a week. Film will be sent twice daily to Delphi's processing and distribution centers and returned to the kiosk overnight. Payment can be made with cash, check or credit card.

The initial system will use IBM Personal System/2s and IBM multimedia technology. The machines were also designed to dispense product promotional coupons for supermarkets and other merchandisers. Shipments will begin in the fall to selected supermarkets in the Southeastern states.

•

Workers at the **Kraft General Foods** group factory in Banbury, UK, are the first in Britain to collect their weekly wages from a **workplace cash dispenser.** The PC-based service lets some 900 workers collect their money at any time on payday. Employees insert a special plastic card into an on-site ATM at their workplace on payday to withdraw their cash. The system was developed by NCR Ltd. Kraft officials say that wage savings and productivity improvements will save the firm approximately 10,000 pounds per year.

•

Self-service bank machines on three continents were linked recently for the first time. Customers of **Midland Bank, Hong Kong Bank and Marine Midland Bank** now can withdraw cash and make balance inquiries from ATMs in the U.S., UK, Hong Kong and China. A typical transaction takes 10 seconds. Plans are for the network to be extended later this year to Oman, Qatar, the United Arab Emirates, Bahrain, the Philippines, Brunei and Thailand.

•

Philadelphia National Bank has successfully tested a **smart banking system** that can read checks, split deposits and give exact change, including coins. The bank uses a product called MAC Icon Services, developed by Core States Financial Corp. Ten banking organizations have already signed up to participate as charter members. On-line service is set for next year.

•

Pick n' Save grocery stores in suburban Milwaukee have installed a **self-checkout system** developed by Checkrobot, Inc. in Deerfield, Fla.

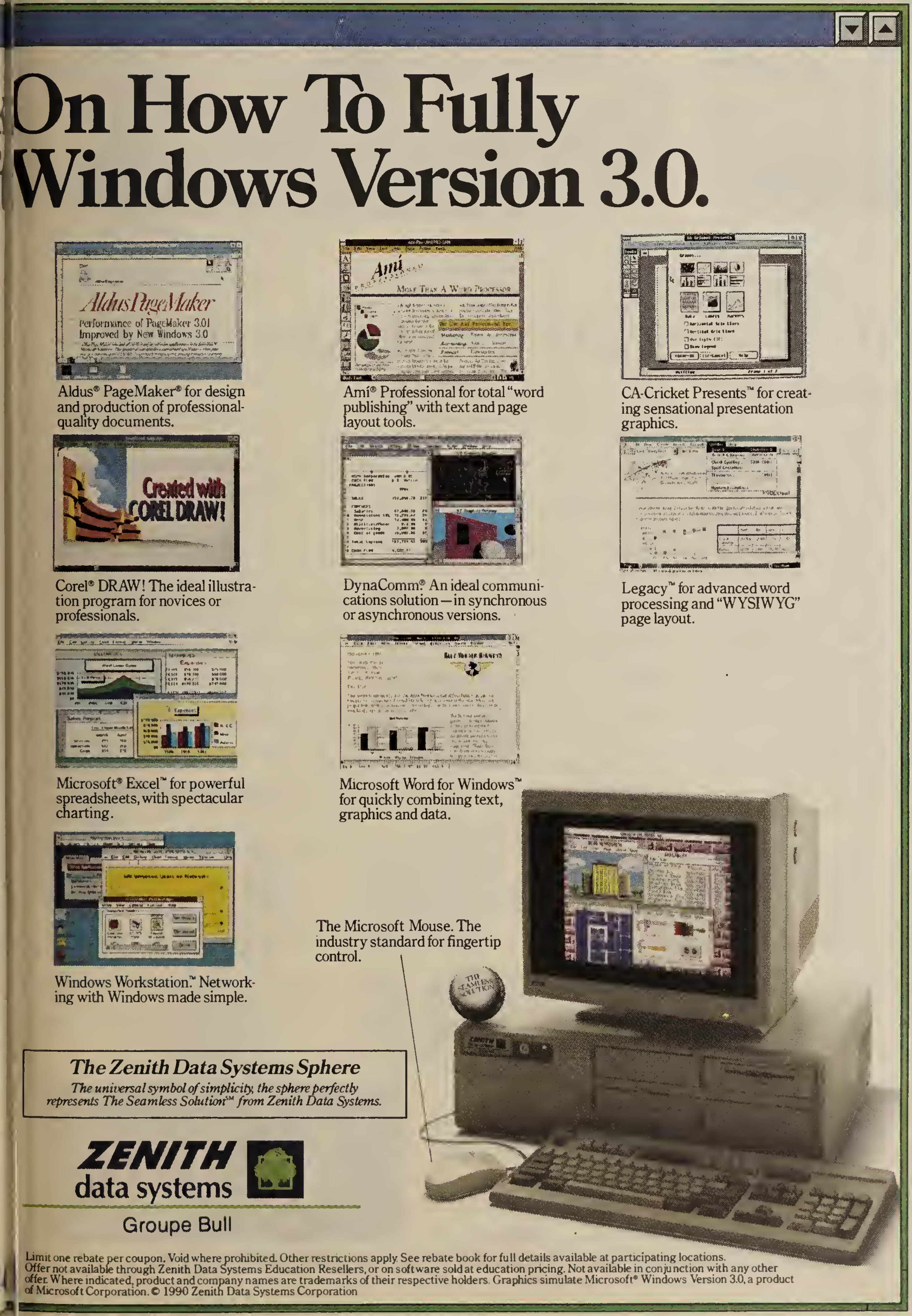
Several European companies are also experimenting with similar technologies. Nixdorf, Inc. in West Germany is now testing a similar system in Spain.

However, these systems don't always make it big. After a trial period, Kroger Co. in Atlanta dropped the Checkrobot system in two suburban stores. Company officials said the system was too impersonal.

•

Diebold and IBM say that a new joint self-service banking venture will focus on application systems and hardware for ATMs. Also planned are **information stations** that provide customers with financial information on their accounts. Final approval of the deal, announced in July, is expected later this year. The proposed new joint venture will be based in Canton, Ohio. •

JOSEPH MAGLITTA



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NATIONAL
BRIEFS

Buy . . .

New York-based **American Express Co.** last week finalized its stock-swap acquisition of Burlington, Mass.-based database maker **Epsilon Data Management, Inc.** Valued at approximately $53 million, the deal gives American Express a proprietary database management software and services line that claims to let users target and communicate with customers and then analyze the input. While Epsilon will operate as part of its new parent's direct marketing group, however, Massachusetts apparently will not be left without it; the current headquarters will be retained.

■

Buy . . .

Microcomputer connectivity products vendor **Microcom, Inc.** made a major move on the Apple Computer, Inc. Macintosh market with last week's purchase of **1st Aid Development, Inc.**'s Macintosh-oriented disk recovery software line and related assets. Terms of the transaction, other than that it was consummated with cash and license fees, were not released by either company.

More national briefs on page 84

Compaq spells 10 years of success

Less innovation in overpopulated desktop arena calls for emphasis on high end

BY RICHARD PASTORE
CW STAFF

Despite ravenous competition and a desolate domestic market, the fastest-growing company in U.S. business history has hardly lost a step as it approaches the close of its first decade. Compaq Computer Corp. has molded and maintained a reputation for technological innovation, robust financials and gauging and satisfying users' needs, observers said.

Yet some of the Houston-based firm's strongest pillars — its product innovation, high margins and gangbuster European growth — seem to be increasingly wobbly, analysts added.

Compaq's products seem to create an indelible perception of premium quality in the minds of users. This is an invaluable reputation for a technology that boils down to an IBM Personal Computer clone. "We view them as more of a premium PC, and we pay a premium price for them as we would for an IBM computer," said Scott Novogoratz, director of MIS at Physicians Plus Medical Group in Madison, Wis.

"Everybody I've talked to [who's] used their products has been happy with them," added Melvin Boyer, director of MIS at Louisiana-Pacific Corp. in Portland, Ore.

Compaq prides itself on having a broad, solid product spectrum. In the fastest-selling PC market today — Intel Corp. 80386SX-based boxes — Compaq is well-positioned with a low-end, midrange, high-end and laptop entry all based on the chip.

"There's not a computer you could ask for that Compaq does not have," said JoeAnn Stahel, an analyst at Storeboard/Computer Intelligence in Dallas.

Compaq armed to face IBM on many fronts

Compaq has a more filled-out product line than IBM in microcomputer segments

	COMPAQ	IBM
Portables	8	1
286 (stationary)	1	2
386SX (stationary)	3	2
386 (stationary)	4	2
486 (stationary)	2	1
Multiprocessor	2	0

(Number of product lines currently in production)

CW Chart: Doreen Dahle

The same could not be said of Compaq's No. 1 rival, PC market leader IBM, which conspicuously lacks a laptop computer or 33-MHz Intel 80386-based PC. "There's no doubt that Compaq's been more nimble than IBM in the product development side," said Eric Zimits, an analyst at Rauscher Pierce Refsnes in Dallas.

Despite Compaq's past success, it is becoming increasingly difficult to innovate in the overpopulated desktop DOS arena, analysts said. "It's hard to differentiate your product if you're running the same operating system that everybody else is running," said Michael Goulde, a vice-president at Open Systems Advisor, a newsletter publisher and consulting firm in Boston. "It's becoming a lot tougher."

Consequently, the bulk of Compaq's research has gone toward pushing the high end ever higher. The firm was among the first to market with multiprocessor systems and desktop machines based on Intel's I486 chip. Though the market for these powermongers has not yet fully bloomed, the machines promise high-margin rewards.

The multiprocessor Systempro has generally been regarded by observers as a slow seller. However, "it's a very high-margin item," noted Will Fastie, editor of the "Fastie Report," a technology newsletter published in Baltimore. "If Compaq felt they would be able to sell just 75,000 Systempros, they'd be jumping for joy."

Top-of-the-line boxes aside, Compaq's stubborn premium prices finally seemed to succumb to competitive pressure this year. In May, the firm introduced relatively cut-rate models for use as network nodes. Earlier this month, it lowered the cost of its market-leading LTE notebook PC for the first time [CW, Aug. 6].

Compaq co-founder and Chief Executive Officer Rod Canion confirmed analysts' expectations that the cost capitulation will continue (see story page 82). This should sit well with users who appreciate the quality they perceive in Compaq PCs but are loath to pay the premium. "Right now, we're often substituting clones for either a Compaq or IBM because budgetary contraints don't allow us to buy the premium product," Novogoratz said.

Despite the recent pricing machinations and prolific rollout schedule,

Continued on page 82

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Compaq won't be resting on its laurels

Compaq Computer Corp. cofounder and Chief Executive Officer Rod Canion recently spoke with Computerworld *Senior Writer Richard Pastore concerning lower prices, slow high-end sales, the health of the European market and new frontiers for the firm.*

Why is Compaq able to log double-digit growth and maintain its leadership position in this incredibly competitive and slowing market?

The biggest reason is our international business. The small investment we made in Europe in 1984 has really come back to pay handsome rewards. In the UK, we probably have our strongest market share position of anywhere in the world.

Analysts say there are early warning signs that Europe may be entering a market slowdown. With more than half of its revenue coming from Europe, how will Compaq be affected?

At some point we have to expect the European market to slow down, but I think it is premature to expect it in the near future. It's going to be at least another couple of years.

Where will Compaq turn if and when the European slowdown does occur?

There are two other very important markets. The first is Eastern Europe. We've got an early start there with dealers open in several of the countries. We also see this decade as the time to make a strong effort in Japan. Those [markets] will happen in the next five or six years.

Beyond that, there's no way that the less-developed countries cannot increase their use of computers; otherwise, they will fall hopelessly behind the rest of the world. There will be an acceleration of those markets for computers sometime this decade.

Have you given up on the U.S. market?

We still see the U.S. market as offering a lot of opportunity. From a new product standpoint, we are very well positioned to gain some share in the latter part

Compaq

FROM PAGE 81

Compaq's U.S. sales increased only 2% last quarter. However, its international markets grew 42%. Compaq's overseas operations now account for more than half of its total revenue. But while high growth in Europe has shielded the firm from the moribund effects of the domestic slump, it also renders the firm subject to the seasonal vagaries of the European markets.

"If Compaq is still not showing any growth domestically and they get hit by a seasonal effect [in Europe], they could have a sloppy third quarter," Zimits warned.

Even more cause for concern is the indication that Europe may be cooling off. "Now there are some spot signs of weakness in Europe in the other hardware segments," said Jim Poyner, an analyst at William K. Woodruff & Co. in Dallas. "Growth rates are slowing down; people are a little more nervous."

Demand for PCs in Europe is expected to be down overall by 16% this year over last, according to IDC Europe in London. Compaq's growth last quarter was down 14% from an incredible rate of 56% in 1988. Apple Europe, which is ranked No. 3 in Europe behind IBM and Compaq, saw a growth rate decline of 9% last quarter over last year [CW, Aug. 6].

While Compaq searches for new geographic markets in anticipation of a European slowdown, the firm will continue to do what it does best: "Keep their finger right on the pulse of the market," Zimits said. "They know exactly what the buyers want and what the end users are looking for in a system."

In The Complex World Of
A Simple, Practical

of this year in the U.S.

But competition from clone vendors in the U.S. seems keener than ever. Aren't they taking market share away from Compaq?
When Compaq enters a market and gains a strong lead, it's really hard to make an impact on us. Because of our higher performance, positioning and typically higher pricing, these kinds of companies normally impact IBM before they impact Compaq.

Still, there have been signs that Compaq is pricing more aggressively. Is that a direct response to your competition?
That's one way of looking at it. We're certainly not going to lead on price, but if anything, we've been a little bit too unaggressive on pricing in the last couple of years. As an overall rule, you're going to see Compaq be a bit more competitive.

You continue to heavily invest research dollars in high-end products, but some market watchers say that there is not much demand for Intel Corp. I486-based boxes. Are your efforts there not paying off?
It will take a couple of years before the 486 shows up as a challenger to the 386. But it's important to us now, especially when you look at revenue. When we sell them, we're making quite a bit of revenue on each one.

It doesn't appear that you've managed to sell many Systempros, according to Storeboard/Computer Intelligence.
It's gotten some press that the Systempro hasn't met our expectations, but that's just not accurate. The fact that you can find dealers who say they can't sell it shouldn't be a surprise to anybody. We never expected all dealers to sell it.

Compaq is a radically different company than it was in 1985. Where do you expect it to be five years from today?
Whether the change will be as dramatic as in the past five years is harder to say. There's only so much farther you can go in becoming a well-known company. We don't have any kind of goal to replace IBM in five years. We're going to do the same kinds of things we've been doing.

Firm plans cost-cutting measures

BY NELL MARGOLIS
CW STAFF

National Semiconductor Corp. last week announced its plans to restructure the company, seemingly in an attempt to soften the blow of lower-than-predicted earnings for its first quarter ended Aug. 26.

The company said it expects to take a one-time charge of $145 million in its first quarter; it also announced that it will cut its work force by 2,000 worldwide.

Reorganization of the Santa Clara, Calif.-based company will also include the following:

- Closing its high-speed, high-density Static Read Access Memory (SRAM) chip manufacturing fabrication line, produced at its Puyallup, Wash., plant.
- Closing its military product assembly and testing facility and consolidating these operations into other locations.
- Restructuring the company's ASIC division by reducing investment in CMOS gate arrays.
- Reducing the number of divisions in the company from six to four.

The changes being made correlate with a decrease in market demand for the SRAMs and "unsatisfactory margins" in the CMOS gate array market, according to National Semiconductor President and Chief Executive Officer Charles Sporck.

Additional reasons for the restructuring include lower demand from the military and increase in pricing pressure in other market sectors, Sporck said.

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Timeplex upswing tied to moderation

BY ELISABETH HORWITT
CW STAFF

The cautious, middle-of-the-road course often proves the safest, particularly when your industry niche is suffering a downturn. Such is the lesson that could be extracted from recent financial upsets in the T1 switch industry.

Shortly after its feisty young competitors, Network Equipment Technologies, Inc. (NET) and Newbridge Networks, Inc., reported dismal second-quarter performances, staid old Timeplex, Inc. — a subsidiary of Unisys Corp. — announced revenue increases of 20% to 25% during the first half of this year as compared with the corresponding period in 1989.

This is a real turnaround compared with dominant industry trends of a year ago. At that time, high-end switch vendor NET was seriously challenging Timeplex's position as the dominant T1 switch vendor, while Newbridge chomped the firm's lunch at the low end. Timeplex was losing its customers' confidence through shipment delays of a year or more in its high-end Link/100 multiplexer and Timeview integrated network management system lines.

During the first two quarters of 1990, however, Timeplex apparently got its act together in several respects. By finally shipping the key products, the vendor was able to both satisfy a pent-up user demand and compete more effectively for new accounts, according to President Dewaine L. Osman. "We've just had our best two quarters in terms of new account type of activity," Osman said.

In addition, Timeplex and Unisys have finally put together an aggressive co-marketing strategy, he said. Timeplex expects 10% to 20% of its revenue dollars to come from sales to Unisys customers within the next year, he added. Previously, sales to the Unisys customer base have been "a trickle," Osman said.

Another key factor in Timeplex's comeback has been its strong international presence, Osman said. "We have distributors in 37 countries, while our competitors don't have that infrastructure in place," he said. Market growth for Timeplex has been "a little better internationally than growth in the U.S.," he added.

Timeplex President *Dewaine Osman expects continued revenue growth*

While admitting some concern about the possible effect of a U.S. recession on sales, Osman said he felt optimistic that he would see a 20% increase in revenue between fiscal years 1989 and 1990.

Meanwhile, Timeplex's rivals are being forced to attack the firm in its position of strength — the midrange switch — because their own primary markets are slowing down, according to Thomas Nolle, president of Voorhees, N.J.-based consulting firm CIMI Corp. "Both NET and Newbridge were successful while the T1 market was expanding rapidly, but a difficult economy has taken the glitz and glamour out of the T1 market, and communications managers are getting back to basics."

Conservative customers have less use for NET and Newbridge's emphasis on leading-edge technology, Nolle said. In contrast, Timeplex, while keeping up with emerging networking developments such as frame relay and fast packet, "never deviated from its midrange niche" and now presents a reassuring picture of stability and dependability, he added.

NATIONAL BRIEFS

Bye-Bye

In the latest chapter of the Stardent Wars saga, **Stardent Computer**'s shareholders held a special meeting last week and voted to remove cofounders and former executives Allen Michels and Matthew Sanders III from the board of directors. Michels and Sanders recently filed a lawsuit accusing Stardent investor/partner Kubota of technology theft.

■

By and by

Last week, a federal bankruptcy judge gave struggling computer company **Kaypro Corp.** a six-week breather from creditors seeking to convert the firm's attempt to reorganize under Chapter 11 of the Bankruptcy Code to a Chapter 7 liquidation. Weighing in favor of the extension until Oct. 3, said His Honor, are the appointment of a new chief executive officer; sole secured creditor **Fujitsu**'s withdrawal from the pro-conversion camp; and upbeat forecasts for late summer sales.

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Hitachi's goodwill campaign banishing bad-boy image

BY JAMES DALY
CW STAFF

LOS ANGELES — Anyone in business knows that money doesn't talk — it screams.

Hitachi Ltd.'s Masayuki Kohama might understand this better than most.

For years, Hitachi has taken hits from U.S. congressional and corporate heads alike. The $48 billion maker of 20,000 products has been socked repeatedly with charges of corporate shenanigans ranging from allegations of industrial spying on IBM to dumping semiconductors in the U.S. and trying to monopolize the flat-panel display market.

In an effort to reverse this perception, Kohama has crafted a wide-ranging U.S. goodwill campaign that mixes cash with creativity and has but one objective: to polish Hitachi's notorious bad-boy image.

"A good deal of mending needed to be done," Kohama said from his 27th floor office overlooking the city. "The U.S. is our most important partner; we need each other."

Since arriving in the U.S. as Hitachi's senior representative in California four years ago, Kohama has worked long and hard donating money, organizing civic forums and striking an unusually high profile for a Japanese executive in his quest to have Hitachi perceived as a welcome neighbor.

Kohama has signed checks for more than $3 million, donating money to San Francisco earthquake victims, organizing a symposium on California transportation issues, supplying power systems to Rose Bowl parade floats and even turning up on a "Lou Rawls Parade of Stars" telethon to hand over a $10,000 check.

Under Kohama's guidance, Hitachi has also sponsored such tony cultural events as the elegant Kabuki theater and concerts by synthesizer artist Kitaro "so Americans will see that Japanese are not just cold, money-mad people," he said.

Kohama's mission is highly unusual for a Japanese firm. "In the U.S. there is the sense of being a 'good' company — one with both a corporate and social responsibility," he said.

Hitachi's Kohama

Such is not the case in Japan, he added, where social needs are the responsibility of the family or state and overt displays of self-promotion are considered distasteful.

Additionally, charitable donations are not tax-exempt in Japan. "In Japan, charity is the job of the government," he said.

However, such cultural readjustments are necessary if Japanese firms are to work successfully in the U.S. without prejudice, Kohama said.

To tackle the assignment of improving its U.S. reputation, Hitachi tapped the 28-year company veteran, who speaks fluent English and has worked in Beirut, Lebanon; New York; Cairo; and Athens.

Kohama's efforts appear to be paying off. Last month, Hitachi was given the prestigious Medici Award by the Los Angeles Area Chamber of Commerce. Hitachi — the only foreign firm among the half-dozen honorees — was specifically cited for its "spirit of international cooperation."

"We don't aim just for profit," Kahama said. "We're in this together. Without each other, we can't survive."

INTERNATIONAL

BRIEFS

The French connection

In a move worth at least the proverbial thousand words on the shifting shape of the computer industry, **Hewlett-Packard Co.** is about to relocate its personal computer group from Sunnyvale, Calif., to Grenoble, France. Heading up the group — more than half of whose revenues currently come from HP's international operations — will be Jacques Clay, former general manager of the PC group's Grenoble division.

PCs OK in UK

For the first time, the value of commercial microcomputers sold in the UK last year accounted for more than 50% of total UK computer sales, according to a recent report in *The Financial Times.* Figures compiled by Pedder Associates, a consulting group that follows the UK computer market, showed the market at an estimated $10.2 billion, up 12.6% from the previous year. Business PC sales, Pedder said, grew 25% to $5.3 billion.

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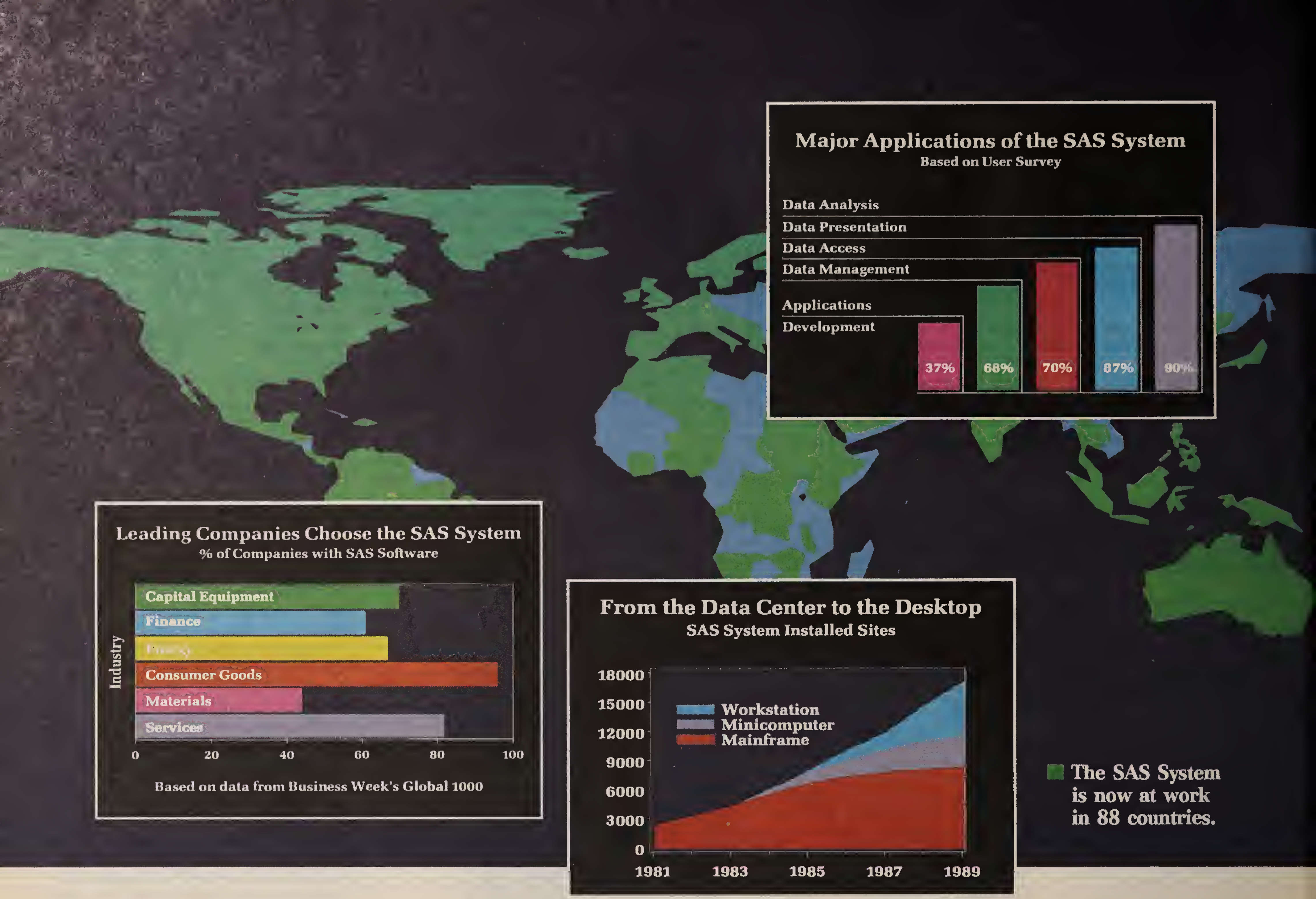

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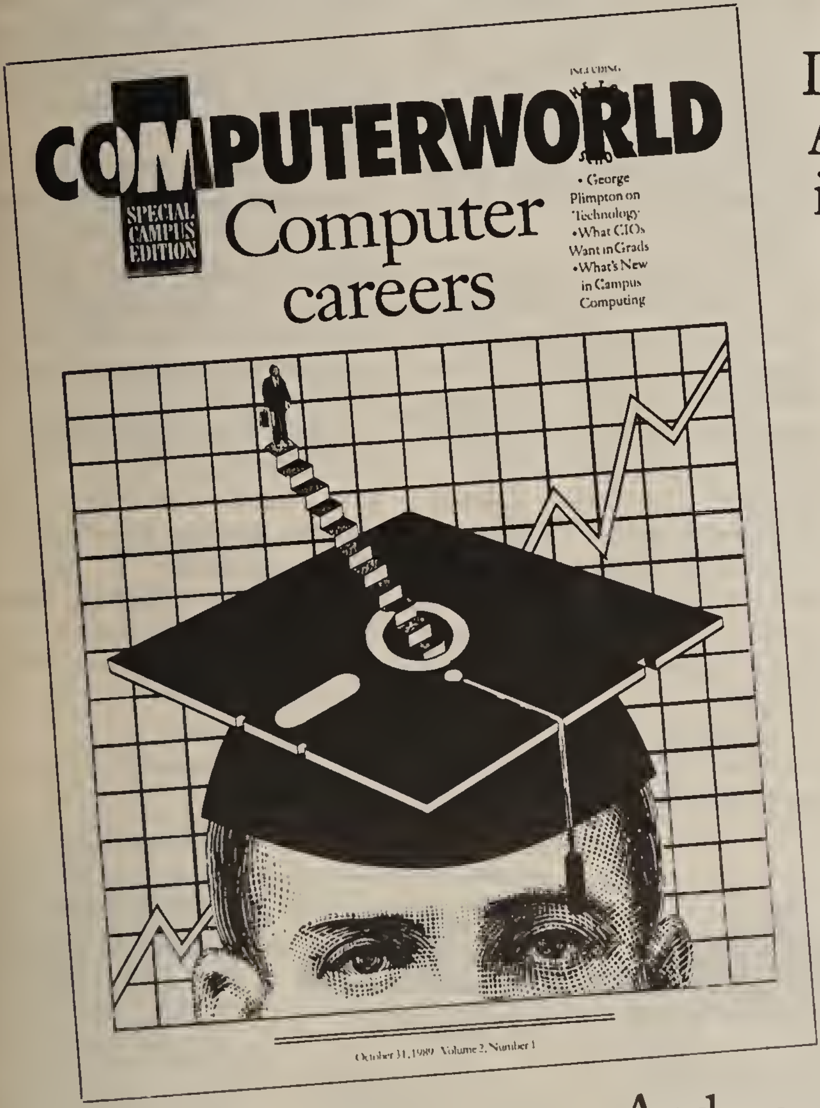

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Planned Editorial Features:

(subject to revision)

- MIS salary and job satisfaction survey
- Where are the best jobs?/What positions are hot?
- Experiences of recent MIS graduates in their first jobs and what helped them in school
- The MIS career ladder
- Profiles of acclaimed top level MIS executives
- The strategic advantage of computers and how they play a key role in running a company

Coming home to the IS effort

Specialists leaving the military are armed with valuable experience

BY CATHLEEN A. DUFFY
CW STAFF

After serving a four-year hitch in the armed services, many information systems specialists decide that a military career is not for them. Others retire from the service but still have plenty of working years ahead of them. How do these people fare in the job market? How valuable is their resume in the corporate IS world, and where are they most likely to find opportunities?

Some military IS work is so specialized — developing systems that control guns aboard naval ships, for example — that trying to transfer it to civilian life can be like cramming a size 10 foot into a size 4 shoe.

But the barriers aren't always insurmountable. Dave Flansbaum, managing director of the recruiting firm Source EDP in San Francisco, says he finds he can sometimes translate experience with arcane systems into terms relevant to the civilian world.

For someone who has worked on a naval artillery system, for instance, a resume might emphasize the programming languages that were involved rather than the applications.

Programming, however, can be different in the military because of the use of specialized languages, according to Carol Covin, a senior systems analyst at Electro-Tech International in Annandale, Va., and author of *The Computer Professionals Job Guide for the Washington, D.C., Area.*

Systems analysts, on the other hand, tend to do the same kind of work whether they're in the military or the private sector, Covin says.

When it comes to management, the military can provide its IS people with unusually valuable experience.

Senior officers seeking high-level IS posts at major corporations stand to gain from the experience of evaluating, acquiring and managing large-scale systems, says Norm Sanders, a managing director at executive search firm Russell Reynolds Associates, Inc. in New York.

Military officers also receive excellent training in leadership that can be applied directly to IS management in the corporate world, Covin says.

The type of experience someone actually acquires in the military can be a simple matter of good fortune, says Jim Marston, a retired Air Force colonel and now senior vice-president and chief information officer at American President Companies Ltd. Marston said he feels he was lucky: He managed all the computers for a national missile warning network, which consisted of about 300 systems around the world.

"If you're fortunate and you get assigned to something that's interesting and challenging like I did, your experience is a good one," he says.

Marston's first job upon leaving the Air Force was as vice-president of data processing and communications at American Airlines, where he found his involvement with the massive Sabre reservation system akin to his military work.

Tom Gildea, a former Air Force captain who is now vice-president of business information services at Helene Curtis Industries, also found that military experience provided an advantage in the commercial job market.

Gildea says that during the Vietnam war, he had access to all the best IS resources, including top technical experts and state-of-the-art IBM equipment. He found that the environment fostered creativity, which in turn helped prepare him for the more cost-conscious corporate world.

Defense contractors are perhaps the most natural place for former military personnel to pursue their careers. Military people are familiar with the contractors' requirements, and the contractors generally need the veterans' expertise. However, recent cutbacks in the U.S. defense budget mean these companies are not doing much hiring right now.

> THE TYPE OF experience someone actually acquires in the military can be a simple matter of good fortune.
>
> JIM MARSTON
> AMERICAN PRESIDENT COMPANIES

That situation can hurt veterans whose military background leads them to be inappropriately typecast as specialists at defense-related jobs. "If a hiring manager hasn't had any military experience, he will view it as a negative or a neutral at best," Flansbaum says. "There's this 'clunkhead' image — that people in the military don't know how to think on their feet, that they don't understand the civilian world."

However, there are other industries that provide a particularly good fit for people with experience in military information systems. "It would be unfair to say they're just out of luck because the defense industry as a whole is contracting," Covin says.

There's an abundance of opportunities in systems integration, and systems integrators are doing a tremendous amount of recruiting in the military, Sanders says. Governments and port or transportation authorities are other natural destinations, he says.

Veterans are also prized by consultants and contractors that work for civilian government agencies, Covin says. They understand the government's procurement needs as well as government standards and specifications.

On another positive note, IS specialists can generally expect to earn more money after leaving the service for corporate work, especially if they've served for a relatively short time. "[The military] tends to underpay and overwork you," Marston says.

Duffy is a *Computerworld* associate editor, features.

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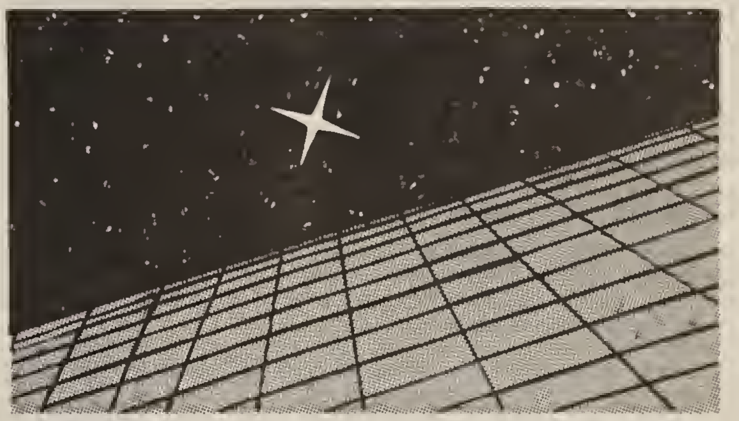

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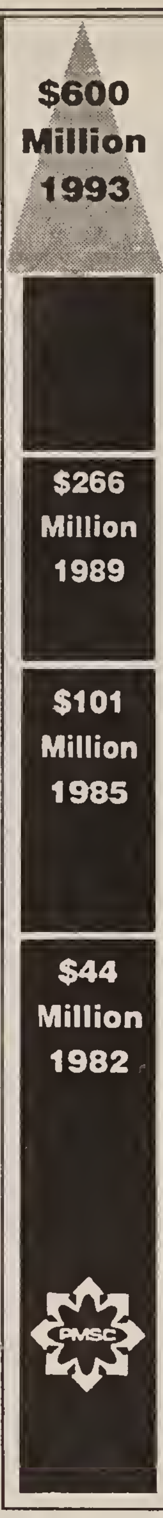

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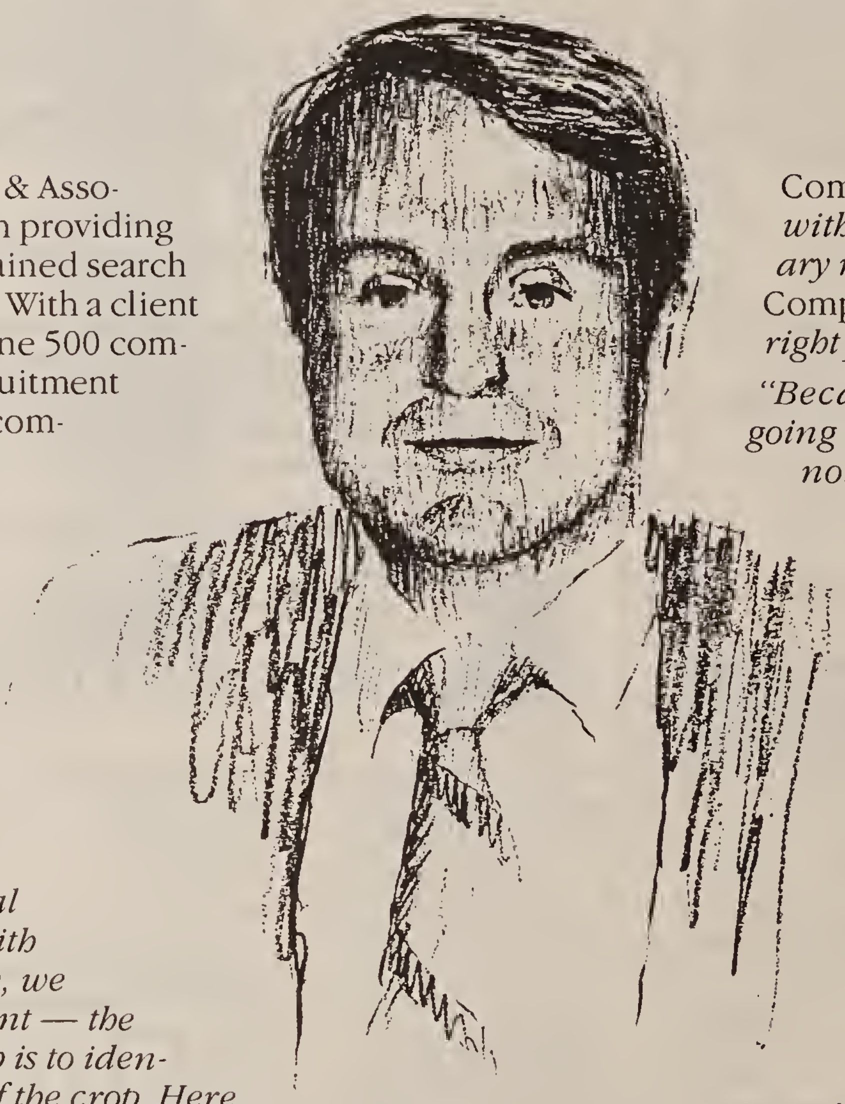

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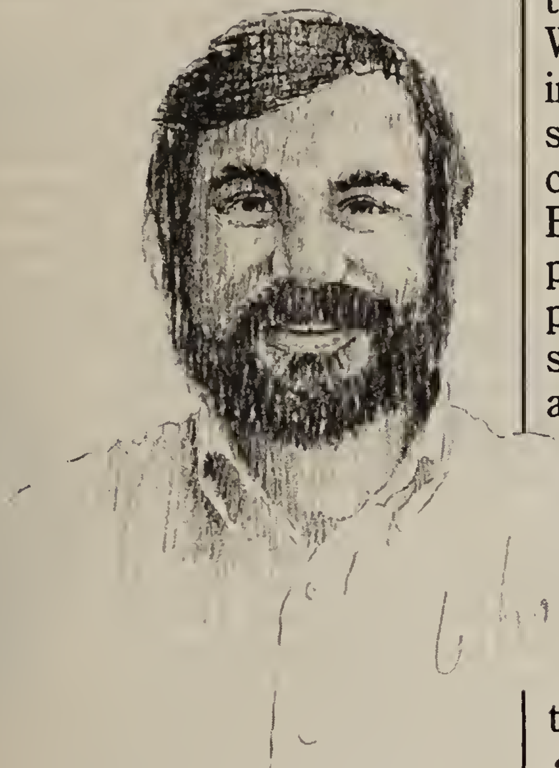

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MARKETPLACE

Languages: The new generation

Make sure your new programming language can deliver its potential

BY JESSICA KEYES
SPECIAL TO CW

Assembler was — and still is — a powerhouse of a programming language. It gives programmers a level of control over applications that few languages can match. Unfortunately, however, assembler is hard to learn and cumbersome to use for most applications.

Cobol became the programming language for businesses in the mid-1970s. It was easy to use and understand and was geared for business applications.

While firms trained Cobol programmers en masse, however, further change loomed. Batch applications gave way to on-line, real-time systems. Mainframes yielded to minicomputers and minis to workstations, personal computers and local-area networks. At the same time, development managers had to write more complex programs and write them faster and better.

Vendors responded with a flurry of editors, computer-aided software engineering tools and fourth-generation languages. However, development managers realized these products were concealing a fundamental flaw: They were using the wrong programming language.

A language need only be sophisticated enough to suit the requirements of the application in question. In some cases, this means only that it can run on a variety of platforms. This is perhaps the primary reason so many companies are turning to the C language.

With its portability to all makes and models of PCs, workstations, minicomputers and mainframes, C is a hard language to beat. The secret to this portability is libraries. C consists of a base language common to all platforms and a series of libraries with unique codes for particular platforms. This approach makes moving a payroll system from a mainframe to a PC as easy as loading and recompiling. And that's not all: There are C libraries to handle everything from complex statistical calculations to gallery-quality graphics.

C also combines business programming with systems programming. Systems programmers use assembler to write programs that direct the operating system. Languages such as Cobol were never given that capability. C, on the other hand, provides the extraordinary ability to direct the operating system from the middle of an application. On a PC, code in a payroll program could check to see whether there is sufficient disk space available on drive E prior to writing out a file.

One of the newer languages in the marketplace is Nantucket Corp.'s Clipper, which also features libraries and portability. Most of the Fortune 500 companies are trying it, along with many hackers. Its following is likely to grow significantly during the next five years.

Information systems organizations also realized that Cobol doesn't always cut the mustard as they pushed into artificial intelligence. For people long involved in AI, the languages of choice have been Prolog and Lisp. They provide the structures necessary to represent knowledge in the form of rules and to handle the circuitous process of human reasoning.

Lisp has actually been around since the mid-1950s. You won't find many shops willing to give up the ease of Cobol for the capabilities of Lisp because of the difficulty of using it. There are, however, pockets of Lisp expertise in companies that require complex knowledge processing. Many other people in the knowledge field have opted for Prolog over Lisp because it provides inferencing capabilities that make programming easier.

Perhaps the hottest new language for the decade ahead is C++. This extended version of C provides the ability to manipulate objects — discrete entities that can store their own data and procedural code.

Objects are independent of one another, but they communicate through messages. They are not modularized programs, but they are similar. A big difference is that objects do not have to be tailored to particular applications or environments. It is therefore possible to "glue" together a series of them, making for very rapid development.

C++ combines the functionality of C with the advanced capabilities of objects. Since objects are the stuff of knowledge representation, C++ is the new darling of the AI crowd.

All these languages are available through computer stores and catalogs. The prices of competing vendors' versions tend to be similar. Considerations to bear in mind when looking at them include the following:

- **Portability.** How easily can you move code from one platform to another?
- **Libraries.** How many of these prewritten codes come with the version or are available for it? Each one eliminates the need to write your own code for a function — creating windows or graphics, for example. They also facilitate portability.
- **Documentation.** How helpful are the manuals? Do they include all the error messages?
- **Training.** Some vendors provide videotapes or other training materials for their version. The prices of these aids vary widely.
- **Editors.** Does the compiler come with a good editor — the device that lets you write the code? A good one lets you write with a full screen, handles libraries and simplifies compiling.
- **Support.** Is there someone on the other end of the telephone to help you out?

Keyes is president of New Art, Inc., a management and computer consulting firm in New York.

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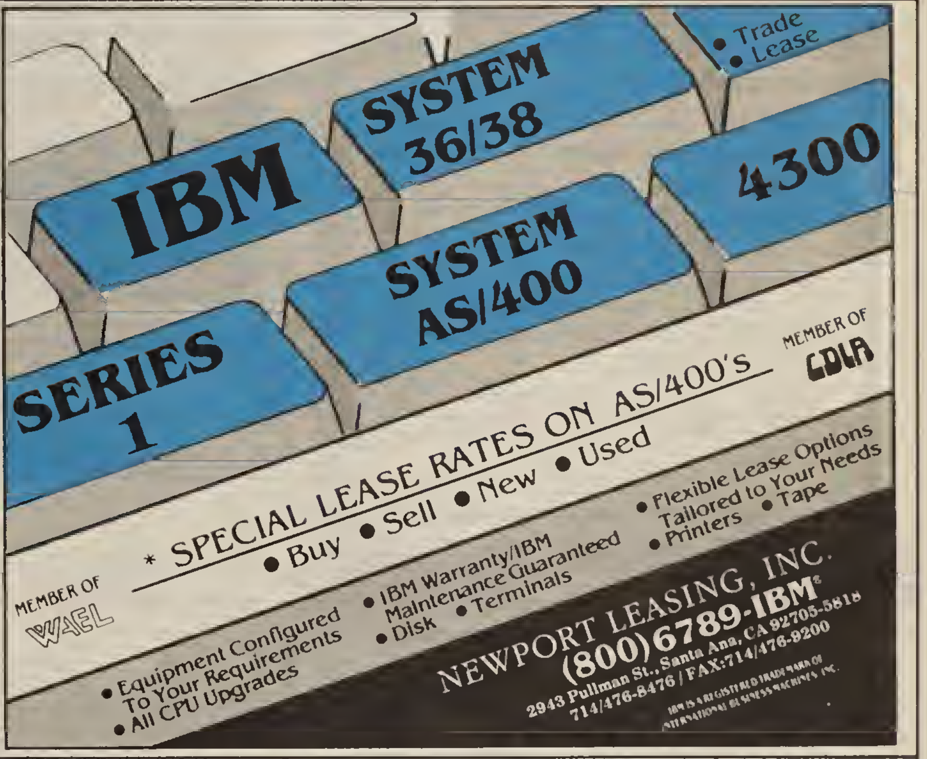

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Beware the dark side of 4GLs

Training can alleviate the inherent problems of user-friendly languages

BY JONATHAN SAYLES
SPECIAL TO CW

As replacements for procedural languages such as Fortran, PL/I and Cobol, fourth-generation languages (4GL) were to usher in the age of end-user computing. They were to release the hold that information systems people maintained over applications and free programmers from the atrocities of coding if-then-else instructions.

The liberal use of 4GLs, however, has brought a number of problems to the surface. The problems have little to do with the products themselves. Instead, they stem from the reasons why people use the products and, even more important, how people use them in production applications. Fortunately, IS organizations can use training to address the problems.

Since the early 1970s, people have used 4GLs such as Mark IV, DMS, Focus and Ramis to set up everything from large system prototypes to small and medium-size production systems and one-shot database queries. These products are extremely chic among business users, who make extensive use of their interfaces to relational databases such as DB2, SQL/DS, Oracle and Ingres.

Most of the popular 4GLs are inherently free-form. Their ability to provide carte blanche in software development is a big factor behind their success, particularly in prototyping large systems. They can make it extremely easy to build files, databases, screens and programs, then glue them together, demonstrate the application, make changes and refine requirements. Used in this way, 4GLs are an unqualified success.

However, the same capabilities can quickly bog down development when people use 4GLs to build true production systems, which must be verifiably correct, reasonably efficient and humanly maintainable.

Systems built with 4GLs are often put into production quickly, do not work as required and are difficult to change because of the lack of worthwhile documentation. They are often slow, inefficient and expensive to run.

The problems generally stem from the lack of rigor in the development and delivery methodology and the system's life cycle. There seems to be a double standard in many companies — one life cycle for traditional Cobol systems and another for 4GL applications — which lacks several key checks and balances.

The training program to address this situation should not dwell on the use of tools. It should consist of a staged curriculum aimed at combating the problems.

The following stages should be included:

- **Process testing and verification.** 4GLs are often prone to the ambiguities and subtleties of the English language. Software developers must apply rigorous testing and verification techniques to assure that users get the information out of the database that they think they requested. War stories abound of problems in this area, yet the typical two-day tour of 4GLs rarely includes the training to address them.
- **Production-mode 4GL development.** Companies carefully scrutinize few of the one-shot queries or small production systems that use non-procedural languages and 4GLs. These projects often lack design and code reviews, project management, system administration, version control, backup and recovery procedures and other nuances of production system development.

The argument has been that programmers didn't have the time for these steps or that users were not up to the task or didn't understand the procedures. But what on earth makes one database more of a production system than another one — the use of Cobol? Training in quality assurance and the management and control of production systems is just as necessary when using 4GLs as when using Cobol.

- **Efficiency issues.** This area gets a little tricky, since organizations tend to develop systems with a 4GL because a people-oriented issue such as flexibility or rapid development is more important than machine efficiency.

All the same, throwing caution to the wind when it comes to the CPU and I/O resources consumed by an application usually proves to be bad policy. Spending months tuning a system would negate the value of using a 4GL, but organizations should employ some minimal level of database and file I/O tuning.

- **Maintainability and structured development techniques.** Unless developers using a 4GL are creating a one-shot program, they must adhere carefully to documentation standards for production-quality systems. Most 4GLs have reasonably good built-in documentation facilities, and they should be utilized.

Users should also apply structured coding principles — they should not use "goto" statements, for example, and should employ intelligent naming standards and abbreviations.

Don't be deceived by the facade of simplicity in which 4GLs have been cloaked. Creating any quality production system takes time and effort. It doesn't matter whether one uses Cobol or a 4GL.

Sayles is director of educational services at The Systems Group, Inc. in Glastonbury, Conn.

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3 **Challenges in dealing with students**
Annual Salary Survey Issue
Ad Close: Aug 28

10 **Training applications developers for downsizing to LANs**
Annual Job Satisfaction
Survey Issue & 3rd Annual
Premier 100 Supplement
(Ad close: 8/10)
Ad Close: Sept 4

17 **Using hypertext training tools**
Product Spotlight/
Buyers' Scorecard:
Mainframes
Ad Close: Sept 11

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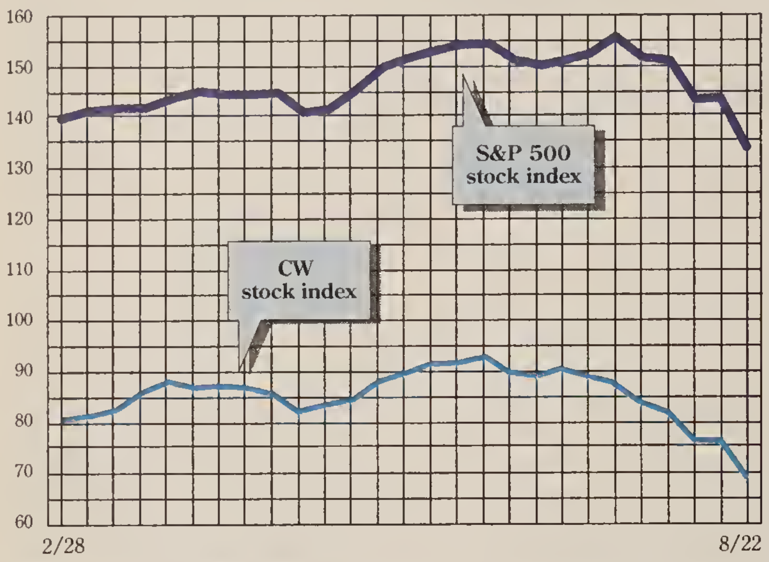

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Leasing Companies	62.1	**56.8**
Composite Index	75.4	**68.9**
S&P 500 Index	143.7	**133.8**

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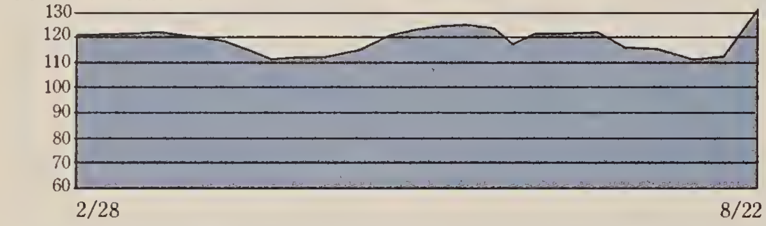

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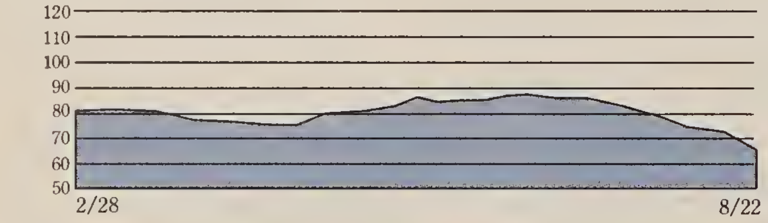

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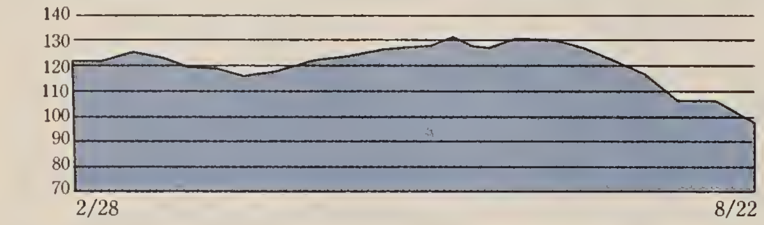

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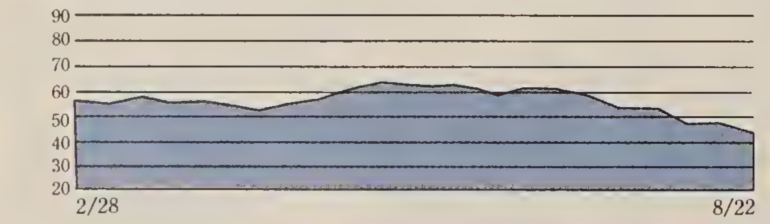

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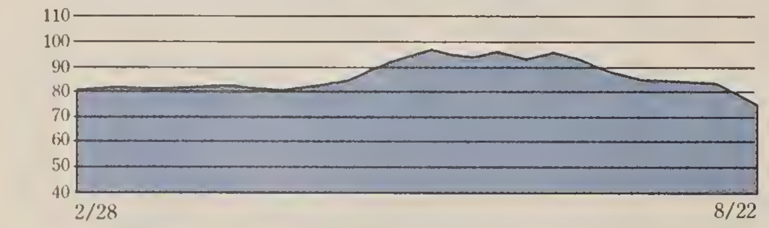

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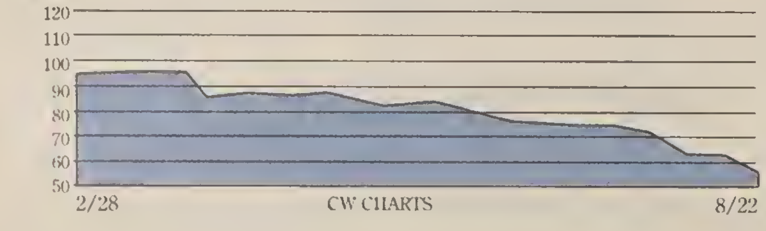

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CLOSING PRICES WEDNESDAY, AUG. 22, 1990

Communications and Network Services

EXCH		52-WEEK RANGE		PRICE CLOSE AUG. 22, 1990	PRICE WEEK NET CHNGE	PRICE WEEK PCT CHNGE
N	AMERICAN INFO TECHS CORP	68	55	56.125	-3.8	-6.3
Q	ANDREW CORP	26	16	18.25	1.8	10.6
Q	ARTEL COMM CORP	10	3	3.125	-0.4	-10.7
N	AT&T	47	32	32.125	-3.1	-8.9
Q	AVANTEK INC	7	2	2.5	-0.3	-9.1
N	AYOIN CORP	21	13	12.625	-0.3	-1.9
N	BELL ATLANTIC CORP	57	42	42.875	-3.6	-7.8
N	BELLSOUTH CORP	59	49	51.75	-2.0	-3.7
Q	COMPRESSION LABS INC	16	7	11	-2.4	-17.8
Q	CONTEL CORP	37	23	29.5	-2.4	-7.5
Q	OATA SWITCH CORP	4	2	3.25	-0.7	-17.5
Q	OIGITAL COMM ASSOC	27	16	15.875	-3.8	-19.1
Q	OYNATECH CORP	21	15	17.25	-0.3	-1.4
Q	FIBRONICS INTNL INC	13	5	7.125	-2.1	-23.0
Q	GANOALF TECHNOLOGIES	6	2	3.063	0.1	2.1
N	GENERAL OATACOMM INOS	7	2	2.5	-0.6	-20.0
N	GTE CORP	36	25	25.25	-2.4	-8.6
Q	INFOTRON SYS CORP	11	3	3.25	0.0	0.0
N	ITT CORP	65	51	52.5	-3.3	-5.8
N	M A COM INC	7	3	4.125	-0.5	-10.8
Q	MCI COMMUNICATIONS CORP	49	31	33	-3.5	-9.6
N	NETWORK EQUIP TECH INC	34	6	6.25	-1.0	-13.8
Q	NETWORK SYS CORP	15	7	9.375	-1.0	-9.6
N	NORTHERN TELECOM LTO	30	20	24.875	-1.5	-5.7
Q	NOVELL INC	59	19	21.75	-5.5	-11.2
N	NYNEX CORP	92	70	70	-6.0	-7.9
N	PACIFIC TELESIS GROUP	52	39	38.5	-3.5	-8.3
A	PENRIL CORP	9	5	6.375	-1.0	-13.6
N	SCIENTIFIC ATLANTA INC	29	18	18.125	-4.9	-21.2
N	SOUTHWESTERN BELL CORP	65	49	49.375	-3.4	-6.4
Q	3 COM CORP	19	10	11	-3.5	-24.1
N	U S WEST INC	41	33	34	-2.1	-5.9

Computer Systems

EXCH		52-WEEK RANGE		PRICE CLOSE AUG. 22, 1990	PRICE WEEK NET CHNGE	PRICE WEEK PCT CHNGE
Q	ALLIANT COMPUTER SYS	9	3	2.563	-0.5	-16.3
Q	ALPHA MICROSYSTEMS	7	2	1.875	-0.3	-11.8
Q	ALTOS COMPUTER SYS	8	5	8.125	0.0	0.0
A	AMDAHL CORP	19	11	11.125	-1.0	-8.2
Q	APPLE COMPUTER INC	50	32	35.125	-4.1	-10.5
Q	AST RESH INC	26	7	17.25	-3.8	-17.9
N	BOLT BERANEK & NEWMAN	9	4	5	0.0	0.0
N	COMPAQ COMPUTER CORP	68	37	46	-7.4	-13.8
N	COMMOOORE INTNL	12	5	5.25	-1.1	-17.6
N	CONTROL OATA CORP	22	13	12.75	-0.4	-2.9
N	CRAY RESH INC	51	31	33.5	-2.5	-6.9
N	OATA GEN CORP	16	5	5.5	0.1	2.3
N	DATAPOINT CORP	6	1	1.375	0.4	37.5
Q	DELL COMPUTER CORP	14	5	11.125	-1.3	-10.1
N	DIGITAL EQUIP CORP	103	64	64.625	-5.3	-7.5
N	FLOATING POINT SYS INC	4	0	1.5	-0.3	-14.3
N	HARRIS CORP	40	26	25.5	-1.8	-6.4
N	HEWLETT PACKARO CO	53	32	32.75	-5.0	-13.2
N	HONEYWELL INC	112	73	92.25	-7.3	-7.3
N	IBM	123	93	99	-6.0	-5.7
Q	INFORMATION INTL INC	15	12	11.5	-0.4	-3.2
Q	IPL SYS INC	14	5	8.75	-1.3	-12.5
N	MAI BASIC FOUR INC	6	2	1.75	-0.1	-6.7
N	MATSUSHITA ELEC INOL LTO	174	117	120	-7.0	-5.5
Q	MENTOR GRAPHICS CORP	26	12	12.625	-1.9	-12.9
N	NBI INC	2	0	0.172	-0.1	-26.5
N	NCR CORP	72	55	58.375	-6.6	-10.2
Q	PYRAMIO TECHNOLOGY	36	13	16.75	-4.8	-22.1
Q	SEQUENT COMP SYS INC	34	14	21.25	-3.8	-15.0
Q	SHAREBASE CORP	2	0	0.516	0.0	0.0
Q	SUN MICROSYSTEM INC	37	15	26	-2.3	-8.0
Q	SYMBOLICS INC	2	0	0.313	-0.1	-16.5
N	TANOEM COMPUTERS INC	30	14	14.125	-3.3	-18.7
N	TANOY CORP	48	28	28.125	-3.8	-11.8
N	ULTIMATE CORP	11	5	5.375	-1.3	-18.9
N	UNISYS CORP	22	8	8.75	-1.0	-10.3
A	WANG LABS INC	7	3	4.125	0.8	22.2

Software & DP Services

EXCH		52-WEEK RANGE		PRICE CLOSE AUG. 22, 1990	PRICE WEEK NET CHNGE	PRICE WEEK PCT CHNGE
Q	AMERICAN MGMT SYS INC	20	11	13.625	-2.8	-16.8
Q	AMERICAN SOFTWARE INC	18	8	8.75	-0.5	-5.4
N	ANACOMP INC	6	2	2.5	0.0	0.0
Q	ANALYSTS INTL CORP	24	14	16	-1.0	-5.9
Q	ASHTON TATE	15	8	7.75	-0.9	-10.1
Q	ASK COMPUTER SYS INC	11	7	8.125	-1.1	-12.2
N	AUTO OATA PROCESSING	60	41	48.375	-3.5	-6.7
Q	AUTOOESK INC	60	33	46.75	-2.0	-4.1
Q	BMC SOFTWARE INC	30	14	23.25	-1.5	-6.1
N	BUSINESSLAND INC	14	2	2.75	-0.8	-21.4
Q	COGNOS INC	10	4	7	-1.4	-16.4
N	COMPUTER ASSOC INTL INC	18	6	7.125	-0.1	-1.7
Q	COMPUTER HORIZONS CORP	17	7	13.5	-0.5	-3.6
N	COMPUTER SCIENCES CORP	59	39	39.375	-2.3	-5.4
N	COMPUTER TASK GROUP INC	12	9	9.75	0.0	0.0
Q	COMSHARE INC	25	16	17.75	-3.3	-15.5
Q	CORPORATE SOFTWARE	16	8	11	-1.5	-12.0
N	GENERAL MTRS (CLS E)	38	24	29.25	-3.4	-10.3
Q	GOAL SYSTEMS INTL	18	10	13	.5	4.0
Q	HOGAN SYS INC	7	2	2.875	-0.4	-11.5
Q	INFORMIX CORP	18	7	7	-1.3	-15.2
Q	INTELLICORP INC	8	4	4	-0.3	-5.9
Q	LEGENT CORP	32	19	18.75	-3.3	-14.8
Q	LOTUS OEV CORP	39	16	17.25	-2.0	-10.4
Q	MICROSOFT CORP	81	29	53.75	-10.5	-16.3
Q	NATIONAL OATA CORP	35	9	9.5	-2.3	-19.1
N	ON LINE SOFTWARE INTL INC	11	6	6	-1.0	-14.3
Q	ORACLE SYS CORP	188	13	13.375	-2.3	-14.4
N	PANSOPHIC SYS INC	19	10	10.875	0.5	4.8
Q	PHOENIX TECHNOLOGIES INC	6	2	2.75	-0.1	-4.3
N	POLICY MGMT SYS CORP	43	30	36.625	-1.9	-4.9
Q	PROGRAMMING & SYS INC	25	15	15.5	0.0	0.0
Q	RELATIONAL TECH INC	10	3	3.375	-1.5	-30.8
N	REYNOLOS & REYNOLDS CO	27	16	15.75	-0.9	-5.3
Q	SAGE SOFTWARE INC	16	8	9.375	-2.6	-21.9
Q	SEI CORP	22	15	18.5	-1.3	-6.3
Q	SHAREO MEO SYS CORP	17	12	14	0.0	0.0
Q	SOFTWARE PUBG CORP	28	14	20.25	-2.9	-12.4
N	STERLING SOFTWARE INC	11	7	B.125	-0.8	-8.5
Q	SUNGARD OATA SYS INC	26	18	18.75	-2.3	-10.7
N	SYSTEM CENTER INC	25	12	11.5	-1.3	-9.8
N	SYS. SOFT INC	29	16	22.25	-2.5	-10.1
Q	WORDSTAR	2	1	0.688	-0.2	-21.4

Semiconductors

EXCH		52-WEEK RANGE		PRICE CLOSE AUG. 22, 1990	PRICE WEEK NET CHNGE	PRICE WEEK PCT CHNGE
N	AOV MICRO OEVICES INC	11	5	5.625	-0.4	-6.3
N	ANALOG OEVICES INC	10	6	6.25	-0.6	-9.1
Q	ANALOGIC CORP	11	8	8.75	-0.4	-4.1
Q	CHIPS & TECHNOLOGIES INC	26	11	11	-3.3	-22.8
Q	INTEL CORP	52	29	32.125	-4.9	-13.2
Q	MICRON TECHNOLOGY INC	16	7	8.25	-0.9	-9.6
N	MOTOROLA INC	88	53	67.5	-7.3	-9.7
N	NATL SEMICONOUCTOR	9	5	4.75	-0.4	-7.3
N	TEXAS INSTRS INC	44	27	27	-2.5	-8.5
A	WESTERN OIGITAL CORP	15	6	9.75	-1.3	-11.4

Peripherals

EXCH		52-WEEK RANGE		PRICE CLOSE AUG. 22, 1990	PRICE WEEK NET CHNGE	PRICE WEEK PCT CHNGE
Q	ALLOY COMP	2	0	0.438	-0.1	-12.4
N	AM INTL INC	6	2	1.625	-0.3	-13.3
Q	AUTO TROL TECH CORP	5	2	2.25	-0.5	-18.2
Q	BANCTEC INC	24	13	14.875	-3.9	-20.7
A	COGNITRONICS CORP	8	3	4.375	-1.1	-20.5
Q	CONNER PERIPHERALS	31	11	20.5	-4.1	-16.8
A	DATARAM CORP	22	8	10.75	-2.3	-17.3
N	EASTMAN KODAK CO	51	36	39	-3.6	-8.5
N	E M C CORP MASS	7	3	4.875	-0.8	-13.3
Q	EMULEX CORP	9	4	5.875	-0.1	-2.1
Q	EVANS & SUTHERLANO	35	18	23.75	-2.5	-9.5
Q	ICOT CORP	2	1	1	-0.3	-23.8
Q	INTERLEAF INC	8	4	4.25	-0.9	-17.1
Q	IOMEGA CORP	6	3	4.063	-0.4	-9.7
Q	MASSTOR SYS CORP	4	1	0.75	-0.3	-25.0
Q	MAXTOR CORP	17	7	7.5	-2.3	-23.1
Q	MICROPOLIS CORP	10	3	5.375	-1.1	-17.3
N	MINNESOTA MNG & MFG CO	91	68	79.125	-5.8	-6.8
Q	PERSONAL COMP PROOUCTS INC	5	4	4.25	0.4	9.7
Q	PRINTRONIX INC	15	9	10.75	-0.4	-3.4
N	QMS INC	21	9	13.625	-1.9	-12.1
Q	QUANTUM CORP	26	9	15.375	-3.8	-19.6
N	RECOGNITION EQUIP INC	8	4	5	-0.3	-4.8
Q	REXON INC	10	5	5.25	-0.5	-8.7
Q	SEAGATE TECHNOLOGY	20	9	9.75	-1.0	-9.3
N	STORAGE TECH CORP	35	9	19.5	-2.1	-9.8
Q	TANDON CORP	4	1	2	-0.4	-15.8
N	TEKTRONIX INC	22	12	12.5	-0.5	-3.8
Q	TELEVIOEO SYS INC	1	0	0.25	0.0	-11.0
N	XEROX CORP	69	40	39.75	-4.5	-10.2

Leasing Companies

EXCH		52-WEEK RANGE		PRICE CLOSE AUG. 22, 1990	PRICE WEEK NET CHNGE	PRICE WEEK PCT CHNGE
N	CAPITAL ASSOC INTNL INC	7	1	1.375	-0.3	-18.5
N	COMOISCO INC	34	16	16.375	-1.4	-7.7
Q	LOI CORPORATION	18	12	11.75	-1.5	-11.3
Q	PHOENIX AMERN INC	5	3	2.938	-0.1	-4.1
Q	SELECTERM INC	8	3	3.125	-0.1	-3.8

Bear attack!

Tech stocks fall down and play dead under market assault

The bear market mauled technology stocks last week, ripping holes in the prices of several firms and stomping others down to new lows by the close of trading on Thursday. Angry bear paws took a big swipe at Microsoft Corp., knocking it down 8½ points by Thursday to 51¾.

IBM and Digital Equipment Corp. each felt the pain of 4½-point blows. DEC slid to a new low of 62½, while IBM closed Thursday at 96⅞, falling despite the introduction of new midrange machines.

Motorola, Inc. was another victim of Wall Street pessimism, suffering a 5-point plunge to 64⅞. Other semiconductor makers escaped with smaller wounds, including Intel Corp., which was down 1 point to 33¼. News of personnel cuts and product phaseouts set National Semiconductor, Inc. back ⅝ of a point to a new low of 4⅜ (see story page 83). Texas Instruments, Inc. sagged to a new 52-week low of 26½, losing 1¼ points. Ashton-Tate Corp. also bottomed out, down 1⅛ points for the week to 7⅛. Oracle Systems Corp. nursed a 2¼-point wound, slipping to 12¾, and Borland International dropped 2⅛ points to 14½.

Some companies managed to avoid the sell-sell fury and came out slightly ahead by week's end. A two-for-one stock split went into effect Monday for Novell, Inc.; by Thursday, its price gained ⅞ of a point to 22. Computer Associates International, Inc. announced plans for a common share buy-back, sending its price up ⅝ of a point to 7⅛. News of a fat federal contract helped propel Wang Laboratories, Inc. Class B issues forward ½ a point to 3¾.

KIM S. NASH

NEWS SHORTS

Hacker hit with prison term

The reputed mastermind of a nationwide gang of some 150 hackers and "phreaks" was recently sentenced to 27 months in prison, reportedly the stiffest such sentence ever. Leslie Lynn Doucette, who used the handle Kyrie, had pleaded guilty to using illegally obtained computer access codes to steal telephone services. Authorities said the ring Doucette headed, apparently the largest ever uncovered in the U.S., caused the loss of more than $1 million in services.

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U.S. losing network edge

The U.S. telecommunications industry remains a world leader in such high-tech areas as advanced switching and transmission equipment, local-area networks and business information services, but U.S. competitiveness has plummeted in the customer premises equipment market, according to the recent report by the U.S. Department of Commerce. From 1984 to 1987, U.S. market share fell 64 percentage points in data private branch exchanges and 59 points in statistical multiplexers.

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Businessland draws suit

Two shareholders filed class action suits against Businessland, Inc. and some of its officers last week, alleging violations of federal securities laws in the wake of the firm's year-end loss of $23 million. The suits, filed in U.S. District Court for the Northern District of California, do not specify an amount for damages.

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Nippon Steel enters PC market

Japanese steel giant Nippon Steel Corp. will test its mettle in the crowded notebook personal computer arena. Nippon, among the world's Top 30 businesses in market value, announced last week the formation of its Librex Computer Systems, Inc. subsidiary. The independently run, San Jose, Calif.-based firm will usher in its first PCs — Intel Corp. 80286- and 80386SX-based notebooks — in the fourth quarter. Librex will leverage the resources of Nippon's Electronics and Information Systems division.

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Encore offers multithreading

Encore Computer Corp. last week announced what it said is the first Open Systems Interconnect (OSI) product to take advantage of the multithreading capabilities of AT&T's System V Streams product. Multithreading allows the system to act as a communications server that can concurrently handle requests to send files or messages from both remote applications and local clients. This means that a system running Encore's OSI software will be able to exchange mail with one system via the OSI X.400 protocol while exchanging files with another via the OSI File Transfer and Access Method.

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Clear view of code?

Next month, look for Clear Software, Inc. in Brookline, Mass., to ship Allclear, a general-purpose flowcharting application that provides a two-dimensional visual map of the massive amount of code or patterns and relationships within complex logic. Allclear is a follow-up to Clear for Dbase, which has sold 15,000 copies. Allclear has already received a glowing review from "Softletter" publisher Jeffrey Tarter, who said that developer Vadim Yasinovsky has a "metaphor that will become an important contribution to software design."

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Kavner leaves Sun board

AT&T executive Robert M. Kavner resigned from Sun Microsystems, Inc.'s board of directors last week. Kavner, AT&T group executive for data systems and federal systems, has sat on Sun's board since June 1988 under a January 1988 agreement in which AT&T acquired 20% of Sun and the two companies decided to work together on Unix System V, Release 4. Kavner said that AT&T no longer needs a place on Sun's board because joint development work has gone smoothly.

CA struts system software stuff

BY JOHANNA AMBROSIO
CW STAFF

ST. LOUIS — Computer Associates International, Inc. blitzed its system software users conference last week with eight new products in the workstation, Digital Equipment Corp. VAX and IBM mainframe arenas.

Much of the new systems software, however, may not be available for a year or more. All of the new packages are scheduled to enter beta testing in the fourth quarter of 1990, and CA executives said that, as a rule, they will be generally available six months later. Prices were not available as of press time.

The new software fulfills some of the company's promises to unify its software under the CA '90s architecture, CA executives said. "We have a cohesive approach to offering integrated systems management solutions within a product line and across product lines," said Mark Wasilko, senior vice-president of marketing. He also pointed to the new products' adherence to IBM's Systems Application Architecture and DEC's Network Applications Support (NAS).

The new products represent four of CA's systems software families: automated production control, automated storage management, data center administration and performance management and accounting.

Most of the new VAX products are versions of existing CA software for IBM mainframes. These include CA-7/VAX, an automated scheduler; CA-1/VAX for tape management; and CA-PMA/Chargeback/VAX for chargeback and accounting. Users will be able to choose between conformity to Decwindows or IBM's Common User Access, CA said.

Also new is CA-Visa, a systems administration management package for the VAX. Where the other VAX software is targeted at shops that want similar systems management tools across both IBM and DEC platforms, Visa is intended for shops that are VAX-only. Visa supports Decwindows and NAS, CA said.

VAX alert

Users, for their part, said they were looking forward to the new VAX products. The Church of Jesus Christ of Latter Day Saints in Salt Lake City already uses CA systems software on its Amdahl Corp. 5880 mainframe. The church would consider putting similar software on its 50 VAXs, according to Russ Duncan, production control manager. "It's very helpful to provide the tools that are in the current IBM world [for] the VAX," he said.

Steve Petruso, supervisor of the production support group at the Salt River Project in Tempe, Ariz., agreed. "It would be great if our schedulers didn't have to know two different scheduling products. And it would also be nice to allow the abend messages on the VAX to automatically appear on our IBM version of CA-7," he said.

Nor did the possibility of having to wait a year for the VAX software appear to faze users. "We're currently trying to align our architecture to see if we really need both the Amdahl and the VAXs," Duncan said. "If we decide to go over totally to the VAXs, it will take us that long to convert anyway."

However, CA announced more than just the VAX software. New on the workstation side are CA-ASM/Workstation, a personal computer-based system for managing tape and other media, and CA-Dispatch/PC, which allows mainframe-resident reports to be downloaded to a PC or a local-area network. Both run under DOS and have IBM mainframe counterparts.

New IBM mainframe systems software packages were also unveiled. These included CA-ASM/Archive for automated backup and archiving and CA-Mazdamon VM, a network performance monitor for the VM operating system.

Additionally, CA said it is now supporting IBM's CICS, Release 3.1.1, throughout its systems software product lines and has brought out new versions of eight existing IBM mainframe products. These included CA-Dispatch 5.0; ASM2 Version 4.0 for direct-access storage device (DASD) management and reporting; CA-Dynam Family for media management; CA-Netman 4.8 for problem, change and configuration management; and CA-Jars/DSA 6.0, a DASD space accounting package.

Gupta's database server to support Netware 386

BY JEAN S. BOZMAN
CW STAFF

SAN FRANCISCO — Gupta Technologies, Inc. edged a bit closer to Novell, Inc. last week as Gupta Chief Executive Officer Umang Gupta pledged to port his SQL-based database server to Novell's Netware 386 operating system during the next one to 1½ years.

Novell owns slightly less than 20% of Gupta, which expects to have $15 million in revenue this year. As such, Novell is one of Gupta's six major investors.

Gupta products include SQL Windows, a graphical user interface that accesses remote databases from DOS machines, the SQLbase database server and SQLnet, a local-area network connectivity package. "We expect our products to run in three major environments: Unix, Netware and OS/2," Umang Gupta said. "We do not intend to port our products to 80 different platforms," he added, in a veiled reference to Oracle Systems Corp.

A statement of direction distributed to the 400 customers attending the conference said, "Novell's investment means that customers can look for easy integration with the Netware 386 network operating system." Gupta plans to ship a Netware Loadable Module of SQLbase Server in early 1991. Future gateways connecting Netware SQL to IBM's DB2 and Oracle's relational database management system are also in the works, Gupta said.

Gupta CEO Umang Gupta

For all the talk of Novell, users at the conference seemed particularly interested in a new release of SQL Windows that has improved memory management for desktop-to-mainframe interactive applications. "We are already using Gupta's SQL Windows for financial applications," said an MIS manager from Prudential Insurance Co. in Roseland, N.J. "I'm looking forward to the enhancements, particularly support for Microsoft Windows 3.0."

SQL Windows 2.0, which is being beta tested at more than 100 value-added reseller and user sites, is set to ship in the fourth quarter. It will support Microsoft Corp.'s OS/2 Presentation Manager and Gupta's SQLbase 4.0.

CEO Gupta also announced future support for IBM's SQL/DS and Ingres Corp.'s RDBMS. Other laboratory projects at Gupta include support for OS/2 Extended Edition and Microsoft's/Sybase Corp.'s SQLserver.

IBM offers bug detection

BY MAURA J. HARRINGTON
CW STAFF

WHITE PLAINS, N.Y. — IBM introduced a software service last week that could change the way in which information systems managers support and maintain applications installed on their systems.

The Failure Analysis and Support Technology Service, dubbed FASTService, runs off of an Application System/400 machine and is designed to automatically detect failures, bugs and problems in application software as well as to capture and record these problems as they occur, the company said.

According to IBM's Alan Hu, director of software services at the national services division, this method of software maintenance is made possible through the use of implanted software probes, or error-detection macros, which the application programmer installs throughout critical junctures of the application. Once the error is captured by the probe and stored on the database, IBM's Automated Service Interface provides electronic connections to the user's customer support group for notification of the problem, Hu said.

FASTService supports customers running either MVS/XA or MVS/ESA using Cobol, PL/1 or assembler, the company said.

Hu said that while FASTService works for both systems software and applications software, the focus among beta testers has been on its use for applications software. "This is a revolutionary concept . . . These tools will enable early detection and handling of the unrecognized problems . . . applicable to all software," Hu said.

FASTService, though similar to other diagnostic and failure-analysis tools, is unique in that it takes an active approach to maintenance rather than a reactive approach, Hu added. "This product is going to make a big difference in software development, operations and problem management," he said.

"A lot of times there are failures in software that you don't really notice. This product cuts down on the length of time that customers need to take to find out where that line of code is that actually caused the problem," said Rebecca Segal, an analyst at Framingham, Mass.-based market research firm International Data Corp.

Segal added that while there are some software problem management systems, to her knowledge there are no software services already on the market similar to FASTService, which is available now on a per-bid basis, according to Hu.

David Paige, help desk coordinator at Children's Hospital in Boston, said that at present, most of the logging of software maintenance and services is done manually, leaving less free time for the service people to do other things.

"We'd be interested in anything that can correct a software problem as seamlessly as possible," Paige said.

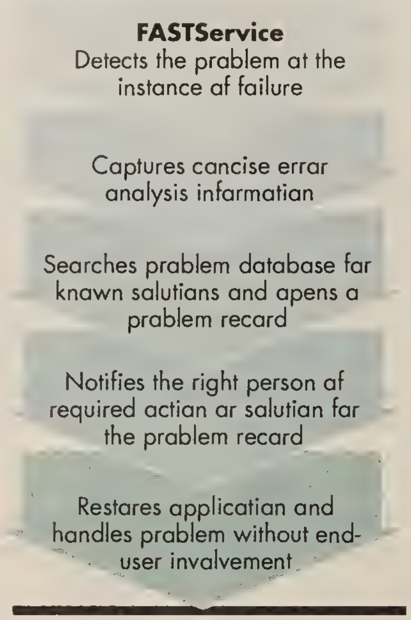
Ed Orlando, a technical support specialist at Rochester, N.Y.-based Bausch & Lomb, Inc.'s applications software help division, agreed. "Right now, we use IBM's Infoman [software problem management system], which requires us to manually report each problem into the system. It would make life a lot easier if we had automatic logging," Orlando said.

Another aspect of FASTService that makes the product unlike the software problem management systems available on the market, Hu said, is its ability to automatically report problems to customer support when there are problems, for example. However, this is only possible if the system is on an IBM-based Netview network, Hu said.

FASTService is scheduled for availability in March 1991.

At your service

IBM's latest service offering is said to automatically detect application software problems and determine what action is needed


FASTService
Detects the problem at the instance of failure
Captures concise error analysis information
Searches problem database for known solutions and opens a problem record
Notifies the right person of required action or solution for the problem record
Restores application and handles problem without end-user involvement

Source: IBM CW Chart: Doreen Dahle

DB2

FROM PAGE 1

statements of direction for connecting DB2 to the Application System/400 and OS/2 database management systems.

Not all users are ready for distributed database management, but many are anticipating using it in the future.

"If it were available on Friday, we wouldn't know what to do with it," said Dan Kavanagh, senior vice-president of information systems at Metropolitan Life Insurance in New York. "But it is part of our architectural direction. As we start to implement [Systems Application Architecture] and cooperative processing, we're going to need to pull data from different files and bring that down to the workstation."

IBM has also apparently solved the problem of two-phase commit, an essential element of any truly distributed scheme, some sources said. Although it was unclear whether the feature would be in the next version of DB2, implementing two-phase commit would remove a big obstacle to distributed data management.

Two-phase commit handles an interruption or a problem during a database update from multiple locations by automatically rolling back the database to where it was before the update was attempted.

"IBM definitely has it," said Ali Hazzah, president of Safe Harbor, Inc. in Pelham, N.Y. "That's the good news. The bad news is that you won't need it, not at first, because the new version of DB2 will support only one update location. If you can only update from one place, you don't need two-phase commit."

In addition to the distributed features, the new release of DB2 will also sport more performance-oriented features, which include the following:

- Concurrent index recovery. This allows DB2 to manage and recover multiple indexes without having to stop and restart the application.
- Direct links into VS Cobol II applications.
- Faster and more efficient reorg and sort commands.
- An increase in the maximum possible number of concurrent users.
- Multiple image copies — the ability for DB2 to manage multiple copies of tables. This way, if a database administrator needs to make duplicate copies of something for security or other reasons, DB2 can deal with them.

Know your SQL

The new release of DB2 will be the first product to implement IBM's distributed database management scheme, which IBM is calling Distributed Relational Data Architecture (DRDA).

In essence, DRDA spells out how the DBMS will communicate among the System/370, AS/400, Personal System/2 and RISC System/6000 product lines. IBM published specifications for DRDA on June 26. The rest of the specifications will be available in the third quarter, said George Zagelow, manager of architecture standards at IBM's Santa Teresa Laboratory.

The goal of DRDA, Zagelow said, is "to allow users of SQL to take advantage of distribution with minimal changes to the SQL they know." This will allow programmers to write software on one machine that goes against databases in another machine without dealing with communications procedures.

DRDA will encompass the following points:

- SQL functionality will increase in steps during the next few years and will eventually allow programmers to write applications that do not need to know where data is physically stored.
- IBM will at first allow distributed computers very limited update access into one DBMS. Over time, on-line access and updating by distributed computers to one or more DBMSs will be possible.
- Initially, DRDA will incorporate like-to-like distribution — from one DB2 database to another, for example. Eventually, all of IBM's strategic databases will be able to communicate with one another.

JOHANNA AMBROSIO

IBM

FROM PAGE 1

information from and make information accessible to various administration applications.

- A user front end, consisting of a common set of definitions for icons, command actions and notification mechanisms through which the user or application can invoke various administrative applications and access administrative data through Systemsview.

Also defined will be a graphics-based workstation that will reportedly be able to do some administrative functions locally, as well as interact with host-based administrative applications via the user front end. The Netview graphics workstation introduction, also expected next month, will reportedly comply with this front end.

- New products to provide more effective management of software and hardware assets as well as overall management of production operation and scheduling.

A number of third-party vendors will add substance to Systemsview by announcing their intention to hook their systems, databases and storage administration software to IBM's framework, said Brian Jeffrey, managing director at Palo Alto, Calif., research firm International Technology Group. In addition, major local-area network vendors such as 3Com Corp., Novell, Inc. and Ungermann-Bass, Inc. will announce support "for that component of the architecture that runs down to LAN management," Jeffrey said.

Of major concern to users who do not happen to be "all-IBM shops," however, is whether Systemsview will attempt to keep them inside the traditional IBM straitjacket of a central, proprietary host architecture, according to John Payne, a telecommunications analyst at Charles Schwab & Co. Firms such as Schwab, which have a variety of workstations and hosts besides IBM's, "want to manage their [millions of instructions per second] across the enterprise" by providing peer-to-peer information exchange between systems, he said.

IBM, however, has yet to indicate whether or how it intends to set up such a bidirectional flow for Systemsview, said Payne, who attended an IBM briefing about the architecture last year. Indeed, few of IBM's rivals will "want to give away the family jewels" by feeding their administrative information to an IBM mainframe, he added.

IBM PLANS A slow rollout that will enable users and third parties to migrate gradually to Systemsview compliance.

IBM does "expect to distribute" the Systemsview architecture, as well as enable it to manage other vendors' host systems, Haile said.

IBM plans a slow rollout that will enable users and third parties — as well as its own Systems Application Architecture (SAA) systems — to migrate gradually to Systemsview compliance, Haile said. For example, existing IBM database products will slowly converge on the Systemsview data structure, Haile said. All IBM SAA systems, including OS/400 and OS/2, will eventually tie into Systemsview, he added.

The role of the IBM Repository in Systemsview has yet to be decided, Haile said.

Users try to catch the HP Wave

New Wave Computing plan puzzles users and challenges developers

BY J. A. SAVAGE
CW STAFF

BOSTON — Hewlett-Packard Co. tried hard to impart its strategy for the next decade at Interex, the annual HP users group meeting held last week in Boston. However, the strategy, New Wave Computing, escaped many users and had HP executives vowing to do a better job of marketing in the coming year.

HP may be having a tough time getting its ideas across to the Interex crowd, but the man usually credited for driving HP into reduced instruction set computing and open systems said HP will have an even tougher time pulling off the new products technically.

"It's a significant technical challenge," said Joel Birnbaum, vice-president and general manager of the firm's information architecture group. "There's a huge problem in decentralized networked systems in protecting security, recovering from errors and doing preventative and [on-line] maintenance." He said that the problems are becoming apparent, but there are no solutions yet.

While marketing New Wave Computing is a tricky path so far, marketing the concept will be easier than mastering the technology, Birnbaum said.

Officially, New Wave is defined as a group of products and methods that allow users to create networks for computers that work together. HP technology that helps create such networks includes object management for encapsulating specific applications to work across multivendor platforms and sharing CPU resources through HP's Network Computing System.

A sampling of users at Interex found that many customers have little understanding of the underlying products and technology.

"I understand the potential impact of New Wave, but I don't understand what it is," said Neil King, support services manager at Scott Paper Co. in Vancouver, B.C. "I want to go out and kick the tires, but I haven't seen any evidence of it to kick."

Mike Killoren, operations manager at Valley School Supply in Appleton, Wis., agreed: "I think they have a problem explaining it. Everyone talks about it, but no one knows what it is."

After attending an HP presentation intended to explain HP's "commitment to open systems" and describe New Wave Computing, Killoren said he still had little idea of the meaning of New Wave Computing.

The company will continue to hammer away at New Wave, vowed Bill Murphy, director of marketing in the networked systems sector. HP is basing its survival on open systems. Even its proprietary minicomputer operating system, MPE, will be opening up to allow Unix applications to run on it (see story below).

This is as much a financial gamble for HP as it is a technical one, according to Birnbaum.

"As you go to more open systems, open markets, the systems become more a commodity and the profit margin is lower," he said.

To counter the risk of opening up to standards, Birnbaum said, the best direction is for HP to become a "leading components supplier."

Unbundling anger

The attempt to wean users off HP's proprietary systems prompted vociferous complaints at the Interex user conference last week in Boston.

While boos and hisses greeted HP executives in a roundtable discussion on unbundling Turboimage database software from the operating system, users were not angry enough at the vendor to picket the closing session and walk out, as some had planned.

With obvious audience support, Fred White, a programmer at independent software vendor Adager in Sun Valley, Idaho, told HP executives that users felt betrayed by the decision to unbundle.

"Ever since 1976, HP always had given it as a freebie — not as a product, but part of the operating system," he said. According to White, HP refused to unbundle in the mid-1980s when the company wanted users to upgrade hardware. Because it was not offered separately from the operating system, users had to rewrite some applications for the database so it would run on new operating systems versions for the more powerful computers.

Software vendors such as Adager have developed their products to use Turboimage underneath. Now, if users want some third-party software, White said, they will have to buy Turboimage as well.

HP has said, however, that the price of the product will not reflect any increased cost in the entire package but will be sold separately. "Some customers want third-party database packages," said Rich Sevcik, general manager of HP's data management systems division. "We wanted to be more competitive in the emerging third-party marketplace."

Other user complaints echoed past roundtable discussions. Users grumbled about the lack of HP marketing savvy and the lack of technical and product sophistication on the part of HP's sales force. As in the past, HP executives replied: "We're working on it."

J.A. SAVAGE

HP to add Unix window to proprietary system

BY J. A. SAVAGE
CW STAFF

BOSTON — In another 18 months, Hewlett-Packard Co. users will not have to buy the company's Unix-based hardware to run Unix applications. The company's workhorse minicomputer, based on the proprietary MPE operating system developed 20 years ago, will have a Posix interface as a window to Unix, the company announced at the Interex users group meeting last week in Boston.

The addition of Posix (the common interface and the applications program interface) and other commercial standards such as the X Window System and the Open Software Foundation's Motif will allow users of HP's 3000 series to run Unix applications and proprietary applications simultaneously, according to Willem Roelandts, vice-president and general manager of HP's computer systems group. However, users will probably experience a degradation in the performance of Unix applications. "We're aiming at 10%," Roelandts said.

The concept of a dual operating system is attractive to Brent Sundberg, a systems developer at Quadax, Inc. in Cleveland. "We'd like to have the Unix market open to us," he said. With this option, Quadax, which supplies billing services for health organizations, would not have to purchase new hardware.

While admitting that a dual operating system is appealing, Tom Collins, manager of common support systems for keyboard maker Keytronic Corp. in Spokane, Wash., was skeptical about the portability of software. "They're assuming that software is really Posix-compliant. [Software developers] like to say it is, but that's not always true."

HP has not announced how the addition will be marketed — whether it will be part of new MPE operating systems releases or sold separately, Roelandts said.

Other announcements

Also announced at Interex was a midrange Unix-based computer. The HP 9000 Model 860S is aimed at commercial on-line transaction processing. It has the same CPU as the lower-end 855S, which runs about 22 million instructions per second but with larger and faster cache memory, and it offers a 30% increase in transactions per second, according to Roelandts.

HP also introduced a new storage product that combines a hard disk and an optical disc for Unix systems. The product is described as an optical-storage server with a total of 22G bytes of storage. The server, contained in two deskside boxes, uses software to shuttle data between the fast-response hard disk and the archival optical discs. Often-used data will stay on the hard disk, Roelandts said. "If you want a file a month later, though, it will take a minute to get it back," he said. The server will also work with Sun Microsystems, Inc.'s workstations

A software product for Unix computers, called Openspool/UX, was introduced. According to the company, it acts as a mainframe spooler for scheduling, executing and routing printer and plotter requests.

Openmail support extended to desktop Unix systems

BY JEAN S. BOZMAN
CW STAFF

SANTA CRUZ, Calif. — Hewlett-Packard Co. has extended support for its HP Openmail electronic mail system to The Santa Cruz Operation's Unix System V/386 operating system, the company said at last week's SCO conference.

Support for desktop Unix applications shipped by SCO means that HP Openmail can be sent across multiple Unix hardware platforms, including HP processors that run the HP/UX Unix system. SCO joined AT&T and Intel Corp. last week in an effort to standardize Unix on such varied platforms (see story page 7).

Openmail adheres to the X.400 international E-mail standard and transmits text, data and images, said Neil French, marketing manager for HP E-mail.

HP said last week's announcement means that users of the SCO Unix version of Openmail can communicate with Openmail users on HP computers, non-HP computers and independent mail services.

Openmail is priced at $2,395 for a single SCO server supporting 16 users. Support for an additional 16 users costs an additional $1,395. The product is scheduled for shipment next month.

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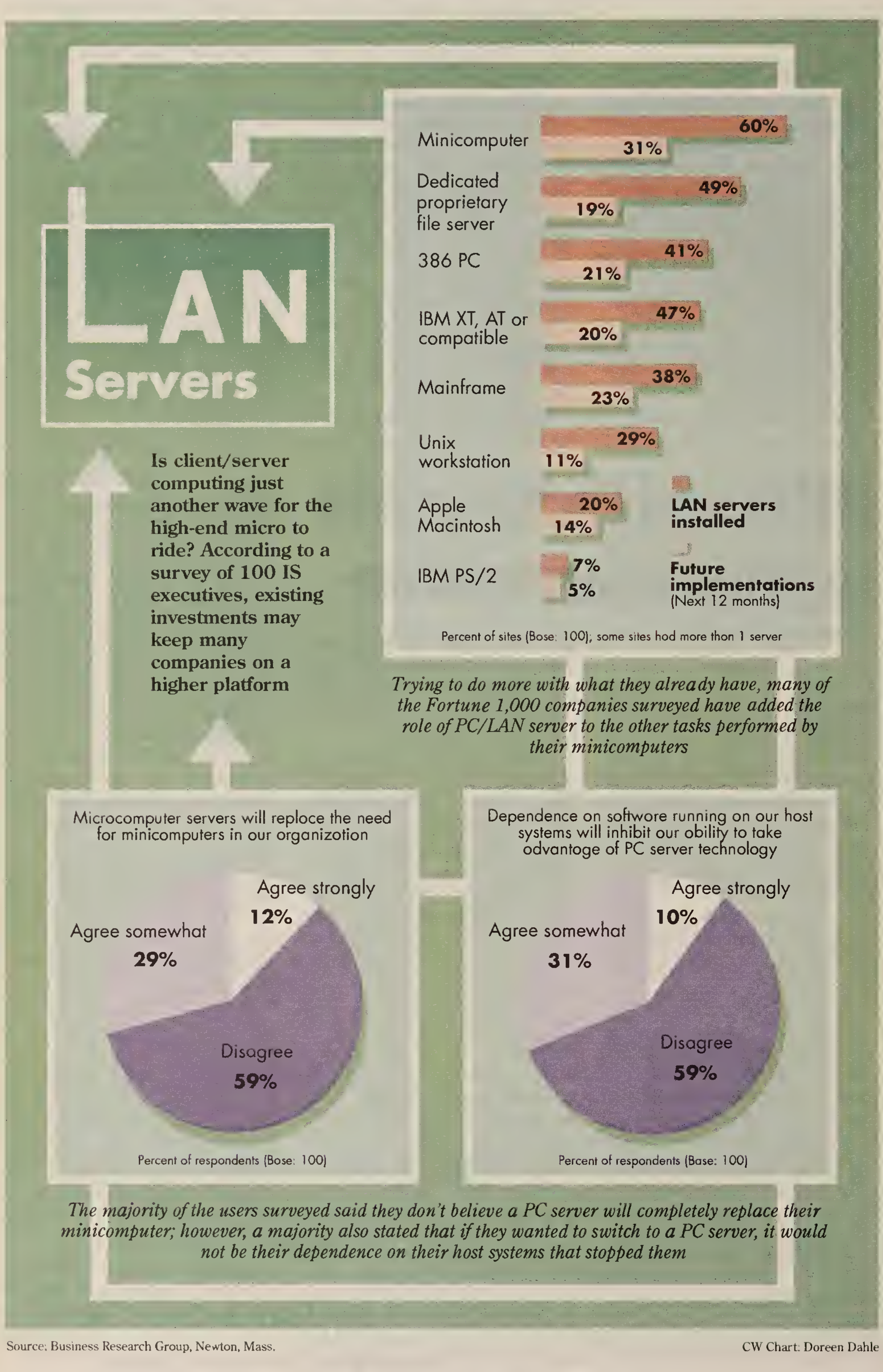

Is client/server computing just another wave for the high-end micro to ride? According to a survey of 100 IS executives, existing investments may keep many companies on a higher platform

Trying to do more with what they already have, many of the Fortune 1,000 companies surveyed have added the role of PC/LAN server to the other tasks performed by their minicomputers

The majority of the users surveyed said they don't believe a PC server will completely replace their minicomputer; however, a majority also stated that if they wanted to switch to a PC server, it would not be their dependence on their host systems that stopped them

Source: Business Research Group, Newton, Mass.

CW Chart: Doreen Dahle

NEXT WEEK

Motorola makes no bones about its strategy to become one of the world's best manufacturers, and that means heavy use of CIM and robotics in diverse business units. Manager's Journal looks at how **Margaret Eastwood**, corporate director of manufacturing systems, coordinates CIM and makes sure that the focus stays on business.

David Joel

IS professionals in some jobs are plucking compensation fruit much more than others. Top IS execs in wholesale and retail trade, meanwhile, seem to be on the heels of their colleagues in other industries. Take a look at *Computerworld's* annual salary survey for a wealth of information examining pay in nine industries and 14 regions.

INSIDE LINES

Mainframe checks out of Hyatt

Chicago-based Hyatt Hotels threw the switch last week and cut over from an IBM mainframe-based reservations system to a cluster of four Unix-based AT&T System 7000 parallel processors. In its first week of operation, the new reservations system was handling 8,000 reservations per day for 160 Hyatt hotels. The cutover followed several months of "stress-testing," according to sources at Informix Software, which supplied the database for the RISC-based processors.

Ready, willing and able

IBM's mighty marketing clout notwithstanding, sometimes it takes a disaster to bring in the customers. Such was the case with IBM's Business Recovery Services Center in Franklin Lakes, N.J., which opened in April 1989. The first customers to use its hot site facilities showed up only a couple of weeks ago, victims of Manhattan's week-long blackout. John Nevola, manager of the unit, said "We were starting to feel like the Maytag repairman for a while there. But we were ready when it happened." Three customers — a trading firm, a bank and an insurance company — used the center during the blackout.

MVS to finally peer up

Along with the 140-odd products that IBM is expected to bring out Sept. 5 will be the long-awaited Advanced Program-to-Program Communications server for MVS, which will finally allow mainframe applications to communicate as peers over an LU6.2 network. While a limited version of LU6.2 now exists for VTAM applications, the new server will take a lot of the communications grunt work off application developers' hands and will also form the basis for IBM's expected announcement of a peer-to-peer Netview link.

Not much tolerance left for this

File-server mirroring, the next incarnation of fault tolerance, could get a private showing at Networld in Dallas next month. Sources close to Novell say the Provo, Utah-based maker of network operating systems could debut its long-awaited System Fault Tolerance Level III to a select audience then.

Poison pen pals

A letter to select customers and analysts from Microsoft executive Peter Higgins was penned to "clear up some confusion" about the level of Windows 3.0 compatibility to be offered by Lotus' as yet unshipped 1-2-3 Release 1.3 spreadsheet. Higgins ticked off all the ways in which the Lotus product will not exploit Windows 3.0, suggesting 1-2-3 Release 1.3 will not use Windows' graphical user interface and that its use of memory limits worksheet size. Lotus fired back with a letter of its own, suggesting that Microsoft must be nervous because it "seems to be trying to confuse the issue as much as possible." Lotus stressed that 1.3 is a graphical spreadsheet and has a new virtual memory management system that lets users build larger worksheets, among other things.

Covering the Global a bit differently

While many companies have lately asked their employees to cut costs whenever possible, surely Cleveland-based Sherwin Williams Co. didn't expect employee Jim Dragel to bike to San Diego, where he is planning to attend the Global Software, Inc. user group conference. Dragel, an avid cyclist and manager of accounts for the paint company, headed out of Cleveland on Aug. 5 and was last spotted in Oklahoma, a Global spokesman said. He was due in San Diego this past Saturday.

Computerworld editors who received Serious Blackjack Tutor disks a couple of weeks back were thrilled, figuring to get some table time in prior to the next Las Vegas trip. But a week later came a message from Blachly Data Systems, the program's publisher, alerting users that the disk had been infected with the Stoned virus. Bill Blachly sent out 48 of the disks before the virus — which displays a pro-marijuana message — was discovered, he said. Pot and disk infections are contraband in this office, but information is not. Call in the legal hot goods to News Editor Pete Bartolik at (800) 343-6474, fax them to (508) 875-8931 or contact COMPUTERWORLD on MCI Mail.

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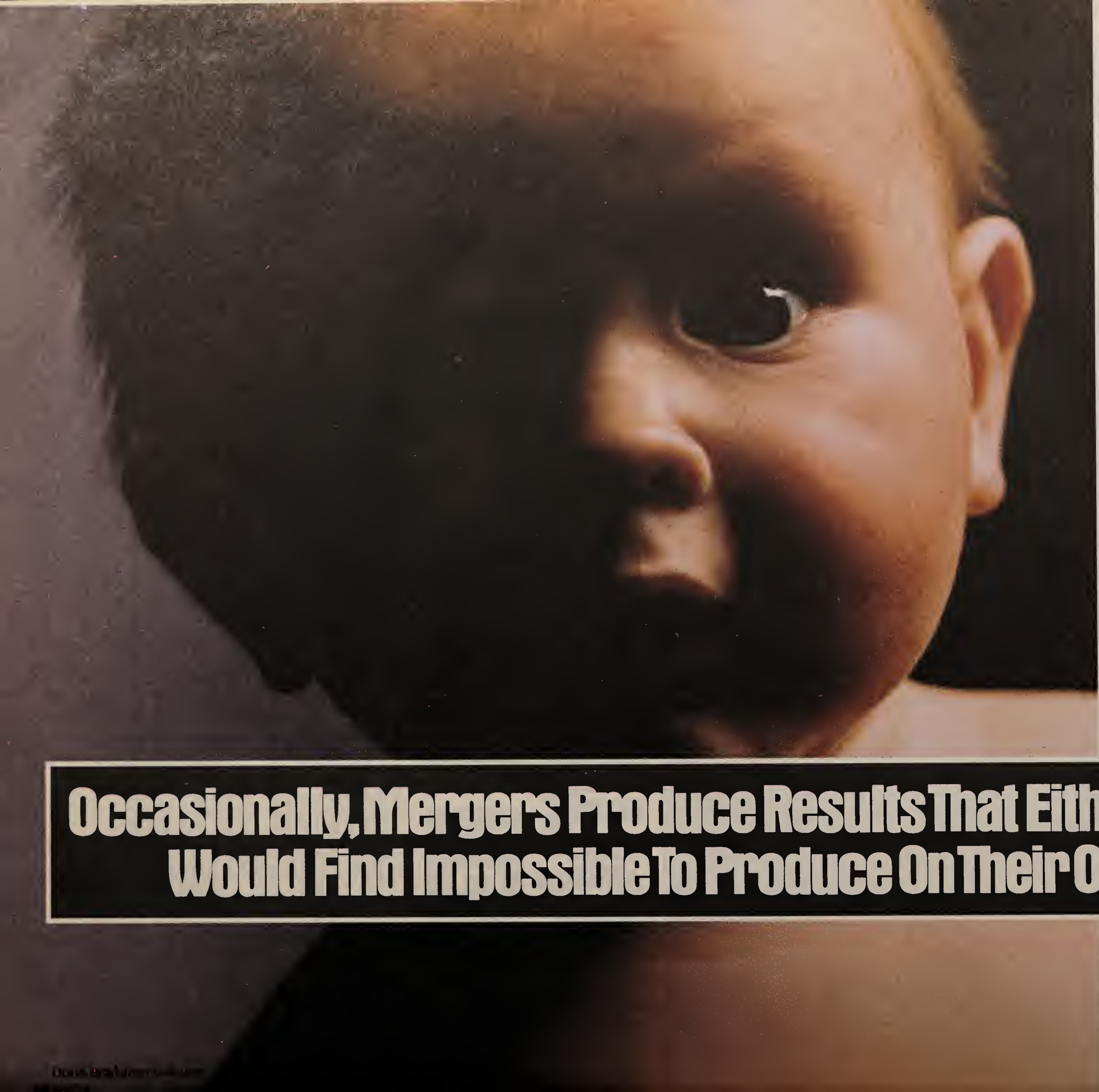
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